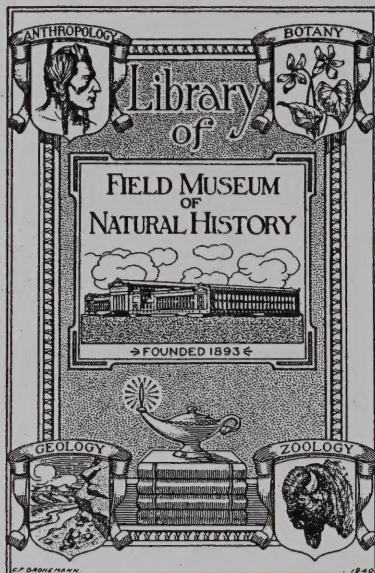


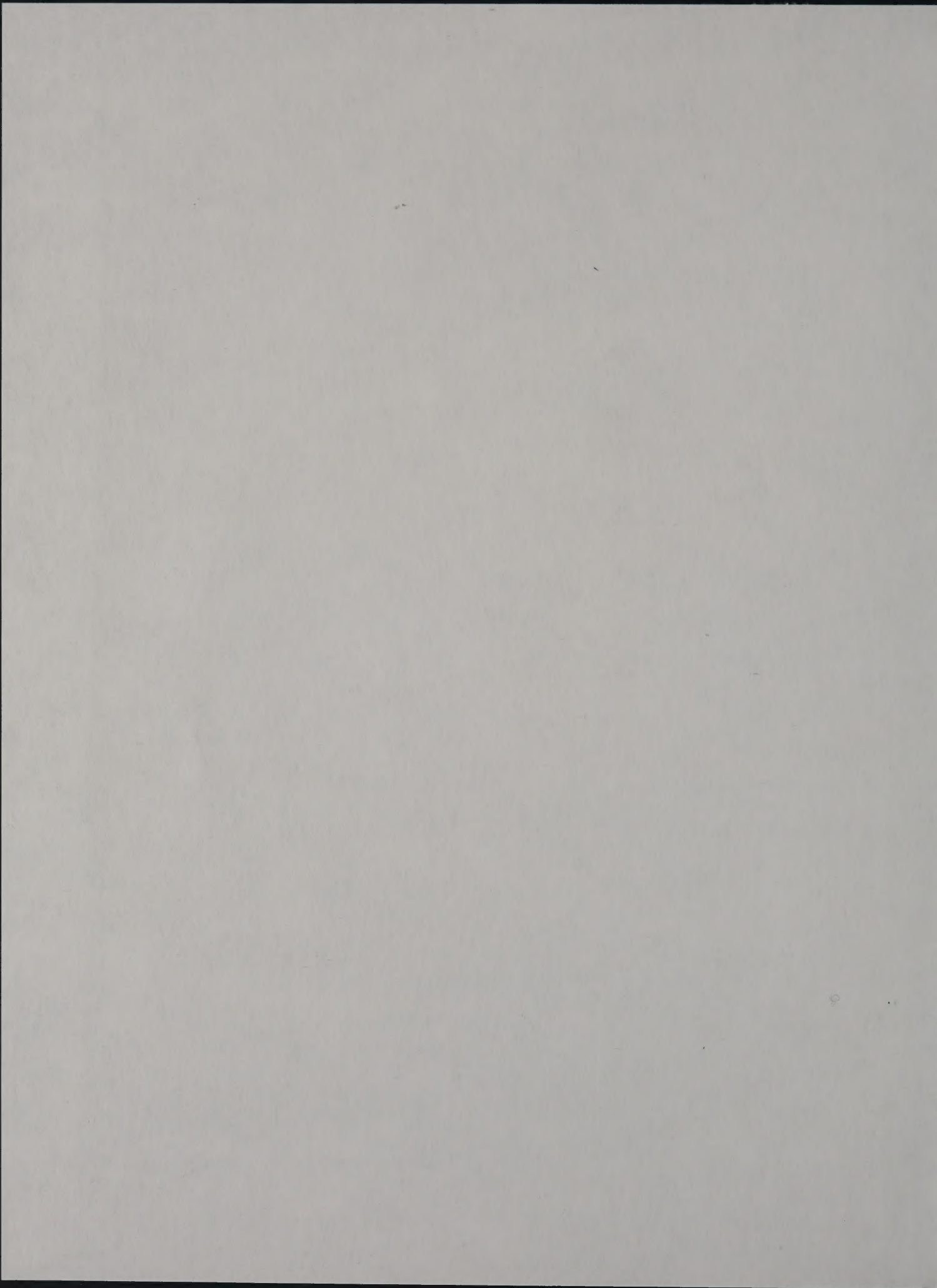
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AMERICAN CONCHOLOGIST

QUARTERLY JOURNAL OF THE CONCHOLOGISTS OF AMERICA, INC.

VOL. 25, NO. 1

MARCH 1997

Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7



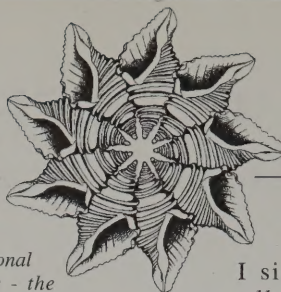
Fig. 8



Fig. 9



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VOL. 25, NO. 1, MARCH 1997

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors - the beauty of shells, their scientific aspects and the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a resolution concerning the conservation of mollusks: *Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.*

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PRESIDENT'S MESSAGE

I sincerely hope this edition finds each of you in excellent health and 1997 has been a prosperous and fulfilling year to date.

This year we are fortunate to have Sanibel-Captiva Shell Club, led by Anne Joffe, as our host club, and the gorgeous South Seas Plantation on beautiful Captiva Island as our headquarters for the COA 25th Anniversary Convention. I hope you are planning to attend. You are in for a real treat. Just imagine white sand beaches, great accommodations overlooking clear blue water, wind blowing through the coconut palms, and yes, of course, the opportunity to renew friendships and visit with all your fellow shell collectors. You get the picture! Don't wait, reserve your place in COA history today. Convention information and registration forms are enclosed in this issue of the *American Conchologist*.

One of the real accomplishments for COA in recent months has been the COA's Web-site and CONCH-L on the Internet. All the members of Lambis Group have done an outstanding job. And it is paying off. We have received many new COA members thanks to this service, and COA is becoming a household name with shell collectors the world over.

At the banquet in St. Petersburg, convention attendees completed a survey. A survey was also included with the September *American Conchologist*. All members who returned a signed survey with their 1997 dues payment are eligible for a \$100 drawing. The winner will be drawn at the COA business meeting in July. I hope we see you there!

1997 will be an exciting year for COA. Plan to participate in that excitement. Take an active role in the organization. COA needs more leaders, individuals with solid ideas. Contact me with your ideas and suggestions. Take the challenge!

Dave Green

The *American Conchologist* is sent to its domestic members by Bulk Mail in March, June, September and December. Publications sent by Bulk Mail are **NOT FORWARDED** or returned to sender. Please send your change of address to:

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In Memoriam



Mario Angioy
Elizabeth Hunter
Mary Jo Meeks
Dale Steinke

253551

COVER: Amy Edwards, COA's Chairman of the Lambis Group for the COA presence on the Internet, is the March cover artist. The shells used in her "Old Book Plate" are the icons she has created for use on COA's website, The Conchologist's Network, or The Conch-Net. Some of the shells are done in watercolor and others have been created on the computer. Can you tell which are which?

FRESHWATER SHELLS — THE EXCITEMENT OF DISCOVERY

by Brian L. McElaney

Even more than twenty years after the fact, I still remember the day my particular interest in freshwater shells began. At age 15, I had just returned from a family trip to the Bahamas with a suitcase full of shells. Always fascinated by the sea, I had just succumbed to the singular lure of shelling on the white sand beaches of the Abacos.

No sooner had my parents started complaining about the odor emanating from dozens of unwashed beach shells than I was out prowling the Boston area shell shops. A small shop in Newton Centre displayed a mouth watering variety of exotic specimens in a large display case. Among the large and brilliantly colored Cowries and Volutes lay two smaller gastropods which were not for sale. Slightly less than two inches long, they appeared rather modest at first glance. Upon closer inspection, however, the olive-colored shells appeared uniquely shaped, with high spires, striking diamond-shaped apertures, and rows of strong spines. The true fascination of the specimens was, however, produced by reading the label. They were identified as *Io fluviatilis*, a river snail from Tennessee.

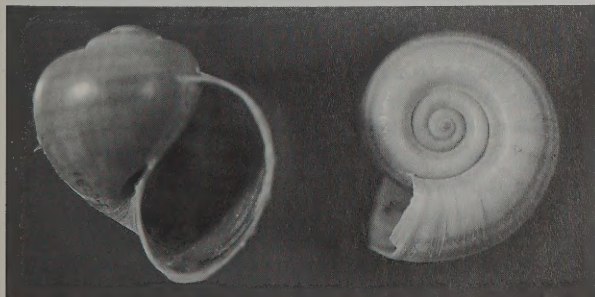
Suddenly, these "modest" gastropods became powerfully exotic. I was astonished that such a remarkable animal existed not on some remote reef or sea bottom, but virtually in my own backyard. Up to that point, my impression of freshwater shells was of the tiny, drab colored snails I had disinterestedly observed during a science project at the local reservoir years before. It was almost inconceivable that the relatively large and sculptured creatures now before me could possibly belong in fresh water. My enthusiasm was, however, dashed by the last word appearing on the label. I had learned in school about the Tennessee Valley Authority and its damming of the Tennessee and other rivers, and now realized that this engineering miracle had produced more than electricity for the southeast. It was perhaps my first lesson in shell conservation.

The last word on the label was "extinct."

Despite my close encounter with the Newton Centre Io's, my collecting pursuits went in a different direction for the next three years. Less than three months after my interest in shells exploded on a small Bahamian Cay, I became certified in SCUBA and plunged into the frigid waters of New England. Not long thereafter, I joined a collecting expedition to the Florida Keys with the New England Aquarium. Following my freshman year in college, I dove with an Earthwatch team studying nudibranchs in Hawaii. My love of diving led me over and over again to the oceans and I was acquiring a large number of marine specimens.

The image of the Io's, however, was implanted firmly in my mind.

Brian McElaney blmcelaney@worldnet.att.net



Left: *Pomacea paludosa*, Tamiami Canal, Collier County, Florida. Right: *Marisa cornuarietis*, Alligator Alley, Collier County, Florida.



Left: *Quadrula quadrula*, Medicine Creek, Ft. Sill, Oklahoma. Right: *Pleurobema coccineum*, Bourbeuse River, Gasconade County, Missouri.

I spent one semester of my junior college year in England. It was while backpacking through Europe during spring break that I first reached into fresh water to collect a shell. The shell was *Lymnaea pereger* and I plucked it out of a tiny, cold stream near my youth hostel in Schaan, Liechtenstein. It was no Io, but it was an interesting shell nonetheless. As I had been interested in the marine nerites I had collected, I was quite enthusiastic to discover that not only did freshwater nerites exist, but that one species lived in European rivers. Shortly after finding the *Lymnaea*, I engaged in a relatively fierce but unsuccessful search for this species, going so far as to free dive in the muddy Avon River in Bath. As it turns out, the little *Lymnaea* was the only freshwater shell I was to collect in Europe for it was there that I acquired a brief but intense enthusiasm for land shells that took me into the forests and away from the streams.

Upon my return home, my attention again turned to fresh water and I decided to see just what those little reservoir snails were all about. Returning to the scene of my science project, I discovered *Physa heterostrophus*. This sinistral snail was of some initial interest. Little did I know that it was also ubiquitous and that I would see more *Physa* in the coming years than I cared to. I expanded my search to the nearby golf course where I discovered *Lymnaea humilis* and *Lymnaea columella*. After a couple of golf balls whistled past disturbingly close to my head, I decided that water-trap collecting left something to be desired. I moved on to nearby rivers and streams, finding a variety of tiny gastropods. It was in the inauspiciously named Mud Pond in Dublin, New Hampshire that I began to discover just how diverse freshwater shells could be. Here I not only found my first freshwater pelecypod (*Sphaerium partumeium*) but also discovered freshwater limpets (*Ferrissia parallela*). I discovered leeches, too, but was not deterred. Within a few weeks, I had found about two dozen freshwater species within a fifty mile radius of my hometown.

But it was the beginning of my stint in the Army that led to my freshwater epiphany. In the summer of 1982, I was sent for six weeks of officer basic training in Ft. Sill, Oklahoma. My first task getting to Ft. Sill, besides learning to salute, was to purchase a map of the post. Without any real idea of what I was looking for, I struck out on foot in 105 degree heat, heading for the closest stream I could find on the map. An

(Continued on page 4)

FRESHWATER SHELLS (Continued from page 3)

hour later, and in the advanced stages of dehydration, I arrived at a tank bridge over Cache Creek and immediately spotted a large mussel valve on the bank. I was nearly as astonished with the appearance of this creature as I was with the *Io*. The shell was heavy, strong and remarkably sculptured with beads and ridges. I had never expected anything so striking to appear in this little stream. For the next few weeks, I collected a dazzling variety of mussels in the Ft. Sill streams. I had no guide book and so had little idea of what I was finding.

Back in my new home of St. Louis, Missouri, I immediately acquired what books I could find on freshwater shells. A Missouri Department of Conservation publication proved to be an outstanding resource for freshwater mussels. The Ft. Sill shell that had spurred my fascination with the naiades was *Tritogonia verrucosa* and it was one of thirteen different mussels I had found on post that summer.

I immediately began exploring the waterways of Missouri's Meramec River Basin and again discovered an amazing array of mussels which virtually covered the riverbed in some areas. But gastropods were much less abundant, which only made another book I had acquired more tantalizing. J.B. Burch's *North American Freshwater Snails* contained page after page of freshwater gastropods; some plain and some exquisite. Among the pages was *Io fluviatilis*. From this book, I determined that Alabama and Tennessee would be particularly appealing places to visit. This opportunity came in the form of a significantly rerouted drive between Missouri and Massachusetts and a weekend trip from a temporary assignment in Washington, D.C.

The rivers of the southeast yielded, in a relatively short time, an excellent assortment of snails, although not nearly the variety promised by Burch's book. I pulled an interesting *Pleurocera* species out of the Coosa River in the midst of an Alabama ice storm. Smaller streams in Alabama and Tennessee yielded species of *Elimia* and *Leptoxis* as well as the somewhat more commonplace *Lymnaea* and *Campelema*.

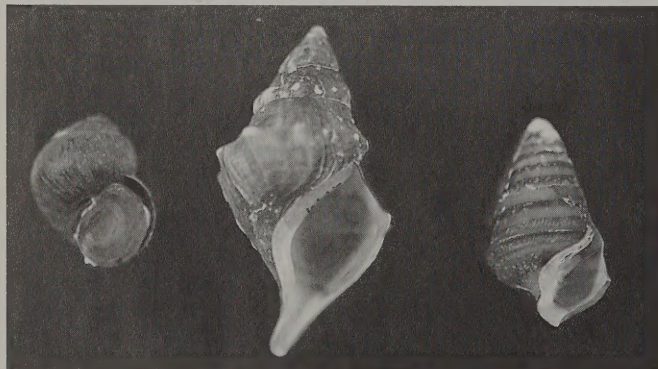


Tritogonia verrucosa from Ft. Sill, Oklahoma.

It was a relatively fine day in the southeast when I was exploring some of the back roads in the Tennessee River Valley. I had stepped onto the bank of one of the larger tributaries of the Tennessee and noted a large number of small forms in the mud. What was perhaps my best moment in freshwater collecting came when I reached down and picked up a handful of *Io fluviatilis*. Some of the shells were long-dead and chalky-white but others were clearly freshly dead, still bearing their periostracum. It was then that I realized that this species' "extinction", of which I had learned in a Massachusetts shell shop fourteen years previously, was perhaps somewhat exaggerated. What followed was about two hours of wading and stone-turning along miles of riverbank. Finally, I reached down into two feet of water, picked a dark form off the side of a large rock and laid eyes upon my first live *Io fluviatilis*. I would estimate that there were about fifteen specimens of this snail on or near that large rock. I never found a single live *Io* in any other part of this river or in any other river that I explored.



Left: *Melanoides tuberculata*, Walindi Bay Plantation, Kilu, West New Britain (Papua, New Guinea). Center (top and bottom): *Sermylasma carbonata*, Stony Creek near Kalangara, Queensland, Australia. Right: *Faunus ater*, Walindi Bay Plantation, Kilu, West New Britain, (Papua, New Guinea).



Viviparus georgianis, Alligator Alley, Collier County, Florida. Center: *Io fluviatilis*, Tennessee River Valley (dead collected). Right: *Pleurocera* sp., Coosa River, Etowah County, Alabama.

I thought it was perhaps unfortunate in a way that I had essentially discovered my "holy grail" so early in my freshwater collecting. But I soon discovered that none of the lure of freshwater was lost. I soon fell into the pattern that every freshwater collector knows. There was no body of water too small or too ugly to be explored. I have taken shells from an irrigation canal in Nepal, from a Chinese garden pool in Bali, and from a stagnant fountain on the front lawn of India's Rambaugh Palace. My wife soon learned to keep a book in the car during drives. In this manner she keeps herself entertained while I poke around in every stream, pond, and puddle in sight.

Many of the shells that I have found have been small and somewhat plain but others have been exciting and unexpected: the spiny *Theodoxus corona* from Thailand, a striking *Thiara* species from New Guinea, the smooth, sinistral *Lanistes boltenianus* from a roadside ditch in Giza, Egypt.

And there have been other grails. While stationed in Hawaii, I searched nearly four years for the "common" endemic *Neritina granosa*, leaving barely a stream on Oahu unexplored. Shortly before being transferred, I finally found this snail (in great abundance) in a large river on the island of Hawaii. While stationed in Europe, I reinitiated my search (begun over a decade earlier) for that continent's freshwater nerites, finally discovering *Theodoxus fluviatilis* on a dike in northern Holland.

It is for this reason that, to this day, all my freshwater shells are self-collected. There is no way to match, through purchase or trade, the excitement of discovery.

But there is concern as well. Although the erroneous label on the specimens of *Io fluvialis* that I saw long ago may have been my first lesson in conservation, I have since learned others. A section of Missouri's Bourbeuse River which I found to be exceedingly rich in mussels just twelve years ago now yields little more than broken valves. An Oahu streambed filled

with *Thiara granifera* and *Neritina tahitensis* in 1984 seemed devoid of molluscs when I rechecked it just a month ago. Perhaps most disconcerting was my return to the Tennessee River Valley in 1995. In the same spot I had found over a dozen individuals of *Io fluvialis* in 1988, I found only a single immature specimen. Even the dead *Io*'s were gone. My hope is that these changes represent normal environmental fluctuations, rather than the effects of pollution or other intrusions of mankind. Time will tell.

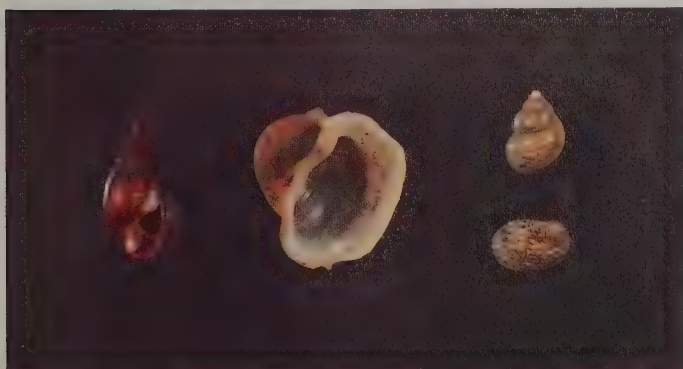
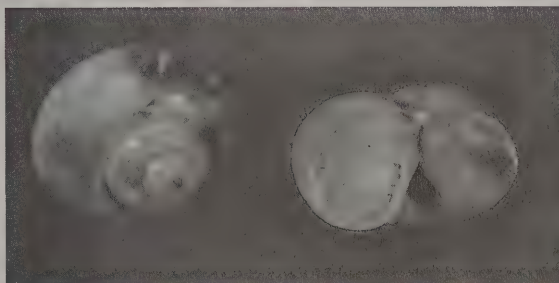


Left top: *Thiara* sp., Walindi River, Kilu, West New Britain (Papua, New Guinea). Left bottom: *Thiara granifera*, Kamananui Stream, Oahu, Hawaii. Right top: *Theodoxus corona*, Hat Nai Yang, Thailand. Right bottom: *Neritodryas dubia*, Walindi Bay Plantation, Kilu, West New Britain (Papua New Guinea).



Walindi River, Kilu, New Britain, where the *Thiara* species was found.

Left and right: *Lanistes boltienianus* from Giza, Egypt and the roadside canal where it lived. (As a matter of orientation, this species is sinistral.)



Left: *Melanopsis praemorsa*, Petaloudes, Rhodes, Greece. Center: *Radix ampla*, branch of Danube River, Vohberg, Bavaria, Germany. Right top: *Bithynia tentaculata*, Vltava River, Prague, Czech Republic. Right bottom: *Theodoxus fluviatilis*, Markermeer, Marken, Holland.

Left top: *Neritina tahitensis*, Waioli, Kauai; left bottom: Kamananui Stream, Oahu (bottom), Hawaii. Center (top and middle): *Neritina violacea*, Batu Ferringhi, Penang Island, Malaysia. Center (bottom) *Clypeolum auriculatum*, Hat Nai Yang, Thailand. Right: (top and bottom) *Clypeolum granosum*, Ka'ahakini Stream, South Hilo District, Hawaii, Hawaii.



Through a Magnifying Glass:

MICROMOLLUSKS

by Ross Gunderson

There is a largely unseen group of shells on the world's beaches. They are the micromollusks, shells which have all the beauty of their larger counterparts, but which remain unseen due to their small size. There are no definite guidelines about when a shell is considered a micromollusk, but a workable range is from about $\frac{3}{16}$ " down to about $\frac{1}{32}$ ". They abound on the same beaches on which you find larger shells, but you have to look very closely to find them. Better yet, look through a magnifying glass! A whole new world of shell collecting now opens up, one with miniature revolving glassy spires, exquisite crenelated towers, subtle curves, alluring proportions, and symmetry. This world can be truly appreciated only by using a simple magnifying glass or a microscope. The sense of discovery is exhilarating and is enhanced by the fact that most shellers walk right by these shells, not knowing the veritable treasure around and under their feet. Now when I walk on a beach and hear the rasp of the sand and the crunch of shells under foot, I wonder what miniature shell marvel I may have obliterated.

What is a Micromollusk?

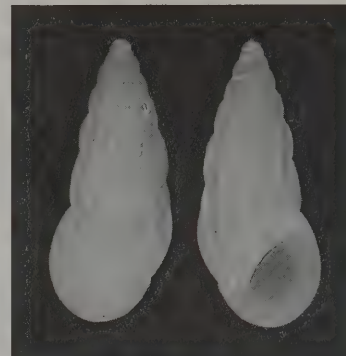
A micromollusk is more than just a small shell. The $\frac{3}{16}$ " down to $\frac{1}{32}$ " range applies to adult shells. A very young *Busycon contrarium* (Conrad, 1840) fits in this size range, but is not considered a micromollusk because its adult size ranges from 4" to 16". There are additional differences. For example, the adult shells of micros are mainly very sturdy in comparison to young shells of larger species. Also the protoconch may be about the size of an entire micromollusk shell, while the protoconch of a micro is correspondingly small. Of course, please remember that there are always exceptions.

Collecting Sites:

Where does one find micromollusks? The answer to this question is rather indirect: look for places where wave action and beach topography will concentrate them, rather than looking directly for them. Find slowly sloping beaches with moderate to low wave action. Since the micromollusks are relatively light they have a tendency to follow the water line down the beach as the tide recedes. With very little wave action they are left behind as the tide goes out. This area defined by high and low tide lines is called the littoral zone. In either case you will see a coarse grit, composed of $\frac{1}{8}$ " and smaller flat pieces as well as rounded pieces, which is hopefully rich in micromollusks. Before taking a sample, look at it with a small magnifying glass. If you see some micros collect a larger sample.

Another place where nature concentrates micromollusks is in depressions in the sea bottom below low tide line and at the base of heads of corals and coral reefs. This area is called the sublittoral zone. Look in depressions for the coarse grit mentioned above. You can pursue this activity in shallow water with a water glass (e.g. a coffee can with a clear plastic bottom) or with a mask and snorkel in deeper water. (My wife and I were collecting in the Florida Keys using a water glass, and there was a small child watching us. He proudly got an old fashioned white enameled dipper from his mom, and proceeded to follow us around holding the dipper to the water

Rissoina catesbyana
Orbigny, 1842. Cate's
Risso. North Carolina to
Texas to Brazil. 3mm.
Elongate, shell with
rounded whorls and a
fairly deep suture. Each
whorl with about 12 to 14
ribs. Look for the
characteristic tooth inside
the outer lip of the
aperture. Translucent-
yellowish to white.



and peering into it. He was having so much fun that I didn't have the heart to tell him our coffee can had a plastic bottom we could see through.)

You can also collect micromollusks on rock shores with higher wave action. Remember that the micromollusks are relatively light, so wave action will pick them up and deposit them farther in shore in rocky depressions. This is the situation in which I collect a lot of my Caribbean micros. The Caribbean islands have, as their shoreline, many miles of coral reefs, eroded, fossilized and pockmarked with small and large depressions which collect sediment brought in by the waves.

Collecting and Sample Preparation:

Both large and small kitchen strainers are ideal for obtaining samples from the water. Small garden or masonry trowels are ideal for collecting samples from the beach or rocky depressions. Place your samples in plastic bags with an indelible location label. Sort your samples by removing larger and smaller unwanted debris (e.g. sand and larger shell fragments). This sorting is easily accomplished by using sieves purchased from scientific supply houses or built from square wood frames (and 12" to 18" square) onto which window screen ($\frac{1}{32}$ " diameter holes) or $\frac{1}{8}$ " hardware cloth has been attached. Stack your hardware cloth sieve on top of one with window screen. Place your sample on the top sieve and run fresh water through the sample while gently shaking the sieves from side to side. Don't worry, micros are relatively tough little shells. The window screen will allow fine sand to pass through while retaining micros and other debris. The larger holed sieve will retain larger unwanted fragments. Keep what didn't go through the window screen, and bake it in an oven at its lowest setting until dry.

Sorting Your Samples:

A small, folding 10X hand lens is a must. If you can afford it, a dissecting microscope is preferable and easier to use (Edmund Scientific). In addition, small tweezers and paint brushes (#1 or smaller) are required for picking up your micros. You'll need a black background, such as black cardboard or a piece of stiff plastic painted black. Use a good light source such as a small halogen reading lamp which can be directed on your sample. Now is your chance to discover the previously unseen world of micros. Spread a small amount of material on the black background. Using your hand lens or microscope, slowly scan the sample. You will quickly find out that most of your sample is not made up of micros, but rather larger silica sand particles, bits of sea urchin spines and tests, coral fragments, and shell fragments. Eureka! I've found a

micro! How do I pick it up? Depending upon its size and sturdiness there are two methods of approach. The tweezers can be used for larger sturdy micros, but beware, the micro may react much like a watermelon or pumpkin seed pressed between one's fingers! Zip, and it is gone in an unpredictable direction. How far did it go and in what direction? You can always get on your hands and knees and look for it or sweep/vacuum the floor and look through the trash. On a bad day they may go zipping along for a distance of three or four feet. An even more distressing end result is to crush the micro into dust between the tips of the tweezers. The preferred method is to use a wet paint brush. Dip the brush in clean water and touch it to a tissue to remove excess water. Touch it to your micro and presto, it's stuck. I delicately scrape the micro off into a small glass jar.

Storage:

I temporarily store my micros, along with a data label, in small watchmaker's cases (Lee Valley Tools) while they are being identified. After identification, I place the smallest shells in a smaller glass or plastic vial with an identification number, sealed in using a cotton stopper. The vial and shell are then placed back into the watchmaker's case and the identification number is written on the data label. The larger micros (e.g. *Anachis obesa* (C. B. Adams, 1845)), simply remain in the watchmaker's case. Long term storage of micros follows the same precautions as for larger shells:

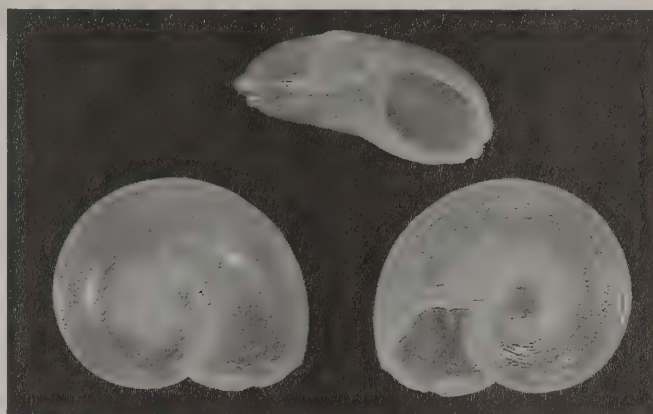
- 1) Store in darkness
- 2) Paper or materials in contact with the shell should be acid free
- 3) Keep the humidity as low as possible.

Most of these requirements can be provided by putting the watchmaker's cases into smaller plastic boxes and placing them into larger airtight food storage containers which are then placed in a dark cabinet. My first micros have been with me for forty years and still look great.

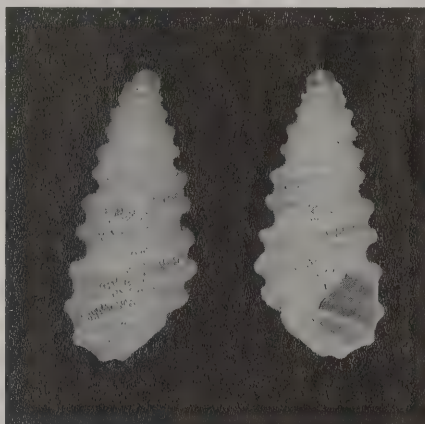
Identification of Micromollusks:

How do you identify micros? The same as with any other shell: plenty of hard work. My experience has taught me to take several pictures of each micro in different positions and lighting. You can leisurely view the pictures without the distraction of squinting through a lens. I use the pictures during the initial phases of identification.

The most common micros are found in the popular guides. However, many of the more uncommon micromollusks are either not found in the popular shell identification books or are spread throughout a great number of books which may or may not be readily available. My first approach is to sit down with all of my books and look at the pictures. This hopefully will produce a tentative identification to either the genus or species level. I then cross check to see if the physical characteristics of the shell match those found in more than one book. During this phase I re-examine the shell with magnification to observe fine details. The next step is to show it to fellow shell collectors and ask for their opinions. Does this identify the shell? Not necessarily. There are usually many more species in each genus than you realize [e.g. *American Conchologist* 1996 24(4):16-17]. The next step is to consult an expert on the particular genus of your shell; experts are usually able to give you the appropriate specific name. As a last resort, compare the shell with other museum material and finally the taxonomic type for the species. If it matches the characteristics of the type, your identification is complete. Of course the real answer to the question depends on what level of certainty of identification you are comfortable with.



Solariorbis infracarinata Gabb, 1881. Gabb's *Vitrinella*. Range, South Florida, Texas, Caribbean. 1.8mm wide, 1mm high, biconvex, carinate, white, umbilicus widening to 1/5 shell diameter. Last whorl excavated above the peripheral keel with a group of fine spiral striae below the keel. Base smooth. Uncommon, shallow water.



Cingulina babylonia (C.B. Adams, 1845). Many ribs and microscopic spirals; peristome entire, thin; color dull, yellowish white. Space between cords concave. Bermuda and the West Indies.

Odostomia seminuda (C. B. Adams, 1837). 4-5 mm. The upper whorls are decorated with spiral cords, bearing large nodules. Body whorl with spiral cords; only the upper 2 or 3 bear nodules. Aperture may be slightly flaring. Color white. Nova Scotia to Florida and the Gulf Coast.



Identification:

Vokes, H. E. and Vokes, E. H. *Distribution of shallow water marine mollusca, Yucatan Peninsula, Mexico*. Publication 54 Mesoamerica Ecology Institute Monographs, Middle American Research Institute, Tulane University, Louisiana.
DeJong, K. M. and Coomans, H. E. *Marine Gastropods from Curaçao, Aruba and Bonaire*. E. J. Brill, U.S.A.
Warmke, G. L. and Abbott, R. T. *Caribbean Seashells*. Dover Publications, New York.

Supplies:

Edmund Scientific Company, 101 East Gloucester Pike, Barrington, New Jersey, 08007. 1-609-573-6250.
Lee Valley Tools Ltd., 12 East River St., Ogdensburg, New York, 13669. 1-800-267-8735.

A RARE PAIR — AND OTHER JEWELS FROM THE NORTHERN GULF OF MEXICO

by Emilio García

Last November members of the Louisiana Malacological Society went on a dredging trip in the northern Gulf of Mexico. Dredging is always very exciting because this method of collecting produces species otherwise unobtainable.

Two years ago, on the Club's first trip, we did our dredging in deep water, from 100 to 200 fathoms. Although I was very pleased with what I obtained, most members were not, because we were unable to collect any of the beautiful larger species that inhabit the area. Therefore, this time we decided to start in the shallow waters off Mississippi, the habitat of *Conus clarki* and *Amaea mitchelli*.

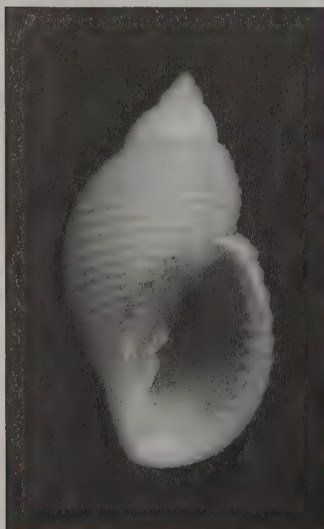
When one looks at the map, the Mississippi coast seems close to the Louisiana shores. T'ain't necessarily so. Going around that Mississippi River delta and to the shallower area on the far side took us 18 hours; once there, we managed but a single, solitary haul. One of our members, utterly seasick, needed to be taken back to shore, 6 hours to Venice, Louisiana, the closest port. That would have meant another six hours back to our position. Because we had the boat for only three days, we decided we could not afford so much time to get back to the shallow water, so we decided to work areas south of where we had originally planned, closer to home port, and deeper than we had anticipated. However, in that one haul in 57 ft., we did get one dead *A. mitchelli*, some live *Cosmioconcha calliglypta* and, more importantly, a number of specimens of an interesting *Terebra* species with FOUR nuclear whorls. All other closely related species have one and a half whorls in their protoconch.

The rest of the trip was rather disappointing at first glance. No volutes, no murexes, not even scallops! Most dredge hauls came up full of gray mud and, when we used the trawl, which was meant to catch fish and shrimp, that was precisely what we caught. We stopped using it altogether and stuck to dredge after dredge full of mud.

Two dredge hauls were different. One was in 50 fathoms, and as the dredge was going down we could see in the fathometer that the bottom was unusually irregular. We found out why less than a minute after it reached the bottom. It got caught on one of the innumerable rocky protrusions that were showing in the fathometer. We did manage to pull it up, but it was totally clean except for a large piece of rock, a number of

gorgonians, basket stars and a few dead shells, including a beautiful, large *Turritella exoleta*. Although our chart clearly said gray mud, we had hit a completely clean, solid rocky bottom with a very uneven surface. This probably would have been a very productive area and, had the fathometer not told us this type of bottom was trouble, we would have loved to dredge that area. We did not, however, want to ruin the second and last dredge in that risky territory. Maybe next time.

Cancellaria rosewateri



Mrs. Cole's *Haliotis pourtalesii*

The second unusual haul was made in 200-245 fathoms. Once again, the charts said the bottom was gray mud, but the haul came up full of stone nodules and pieces of branched star coral. Rick Kaiser, a geologist who formed part of our expedition, thought they were siderite (FeCO_3), later on confirmed by University of Southwestern Louisiana Geology professor Melinda Tucker. (As a matter of fact, the nodules became somewhat sensational news for the department because they were wondering how those siderite nodules, usually connected with swampy areas, ended up in 1500 ft of water.) It was in this haul where we obtained one of the more interesting species, which, at first glance, I could not identify. The mouth was packed with mud and we were too busy to spend time cleaning specimens. At home, however, I identified it as *Cancellaria rosewateri* Petit, 1983.

In 1982 I had received a letter from Mr. Richard Petit, the well known cancellariid expert, asking me if I had seen this species (picture included) in my collecting trips. Of course, I had not; and later on he sent me his article with the description of the new species. When I recently contacted Dick to tell him about the new find he told me there were known only 2 specimens at the Smithsonian Institution and one in a private collection. It is so unique that the species has not been assigned to a specific genus yet.

The three earlier specimens and mine were collected in the same general area! Could it be that the species is restricted to this very limited area by this habitat of siderite nodules? It was also in this haul where we found *Coralliophila lactuca*, *Epitonium fractum*, *Nystiella atlantis*, *Puncturella acuminata*, *P. antillana* and a very interesting specimen of an unidentified *Solemya* species that measures over 98mm. Later on, in grunge from this area, Mrs. Caroly Voss of Hammond, Louisiana, found a specimen of *Epitonium pourtalesii*.

It was also in grunge where another important species was later on found. This time in a haul that we did at Sackett Bank, off the delta of the Mississippi. We had tried this area in our first expedition and had come up with a dredge full of *Vermicularia*, some hard coral and a few rocks. On the first trip we had dredged at the top of the mound, in 33 fathoms. This time we dredged somewhat deeper, between 34-52 fathoms, and the dredge came up full of muddy sand and very dead shells. Disappointed, we dutifully packed all the grunge in bags, divided them among the group, and went home.

(Continued on next page)

It was some weeks later, as I was in Baton Rouge busily inspecting specimens extracted from the grunge from that station, when Mrs. Harriet Cole casually asked; "By the way, Emilio, what is this *Haliotis*?" All I could say was no...no...no...NO! Needless to say it was our tiny, but unique, *Haliotis pourtalesii*. You may remember Mrs. Cole; she is the lady who found the *Poirieria bowdenensis*, also in grunge, in our first expedition (*American Conchologist*, March, 1996, p.3). I think we will forget to invite her next time around.

All in all, we were surprised that so many species which, in the available literature, had been restricted to southern Florida and the Caribbean had been found in the northern Gulf, and that the family best represented in our dredgings, after the Turridae, was the Epitoniidae. The following epitoniids were collected: *Epitonium fractum*, *E. pourtalesii*, *E. candeanum*, *E. novangliae*, *Amaea mitchelli*, *A. retifera* and *Nystiella atlantis*. Other interesting species found were *Delectopecten vitreus*, *Poirieria bowdenensis* and *Emarginula tuberculosa*; and Mrs. Juanita Cacioppo found in her grunge a specimen of the rare and interesting species *Primovula vanhyningi*.

SOLEM ISLAND, AUSTRALIA

The late Dr. Alan Solem, of the Field Museum of Natural History in Chicago, has recently been honored: he has had an Australian island named for him. Solem Island is an inshore island in the Institut Group on the Kimberley coast in NW Australia. It lies in the Admiralty Gulf at 14°12'20"S; 125°38'26"E among a group of islands, all of which lacked names at the time Dr. Solem visited in 1988. He was then part of a joint expedition of the Field Museum, the Australian Museum and the Western Australia Museum, in conjunction with the W.A. Department of Conservation and Land Management, to survey these islands and an isolated patch of Kimberley rainforest.

An attempt was made to name an island for Dr. Solem in 1988, but because geographical locations cannot be named for the living, the name was rejected. Since his death Australian efforts to have an island named for him have met with success, and Solem Island is now on the map as a fitting tribute to Dr. Solem's work on the molluscan land fauna of Australia.

Dr. Solem's brilliant and dedicated fifteen year study of the camaenid landshells of Australia ended in February 1990 with his sudden death of a massive heart attack. This last major work of his very productive life has led to eight major papers and descriptions of a new subfamily, 29 genera and nearly 200 new species. As recently as July 1993, 39 new species descriptions of Camaenidae by Dr. Solem were published in Supplement 43 of the *Records of the Western Australian Museum*. For a more complete discussion of his work and career, see *American Conchologist* 18(3): 9-11 and the 1991 *Journal of the Malacological Society of Australia*. (Source: *Australasian Shell News*, No. 93, Nov. 1996.)

Our Brazilian Connection: BRAZILIAN SEASHELLS: AN UNEXPLORED WORLD

by José Coltro

For many years I have been working with Brazilian shells. I remember when I was 5 years old collecting *Olivancillaria vesica* in Santos—today a very polluted port near São Paulo. I started to study Brazilian shells as a serious hobby 15 years ago and since that time I have begun to notice a lot of mistakes in our classifications. Most of our material has been compared with the Caribbean species, by description, photo or drawing, but never by using actual specimens. Lots of absurdities have been printed: for instance, Lange de Morretes, in his catalogue in 1947, declared that *Cypraea moneta* was found in Salvador! He didn't know that a boat sank last century with lots and lots of this species aboard; the Portuguese used to exchange them with Africans for slaves. Storms brought some of those shells to the beaches and Morretes considered it an normal occurrence!

Thirty-three years later, Professor E.C. Rios, in his first book, *Coastal Brazilian Seashells* (1970), set out to list the Brazilian species correctly. Rios' book had few photos, but it had much better descriptions than Morretes, who carried no illustrations or descriptions. But Rios compared most of the shells with the Caribbean fauna—the only way known to proceed at that time, but a dangerous practice, because there are common species for both areas; but many species considered to be only Brazilian forms of Caribbean material are really new to science. After another three books (1975, 1985, 1994) Rios still has some mistakes, and mysterious species are still there.

If you collect the *Pisania auritula* in Aruba and compare it with the specimens found along the coast from Para State (North Brasil) down to Espírito Santo State (Central Brasil), you will see that they are the same species, but south from there, the species that Rios considered the same species has enormous differences. This identical situation commonly occurs with regard to many other species: our *Astraea tecta*, *Phalium granulatatum*, *Cyphoma intermedium*, and others. My brother

Marcus and I convinced Professor Rios that *Cymatium raderi*, *Phyllonotus oculatus* and *Oliva circinata* are the true species from the Brazilian coast. Rios formerly considered *C. raderi* to be like a large *C. femorale*; *P. oculatus* was *P. pomum*; and *O. circinata* was *O. sayana* or *O. reticularis*.

Most of the confusion occurs because almost no research is done in Brasil on shells that are not commercially important; but there are lots of studies about oysters and mussels, important fisheries products. Nor has there been much medical research done on fresh-water species and their relationship to disease.

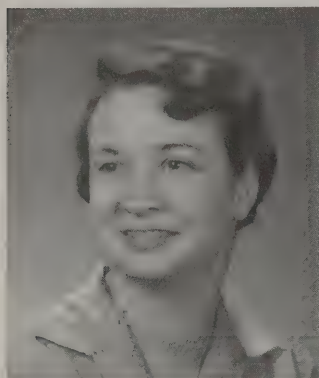
Since last century few research boats have dredged our coast looking for shells and there are places, especially in north Brasil, where there has been no research at all. I never saw a single shell dredged off Maranhão—only few shallow water species trawled by nets, never deeper than 50-60 meters. I saw a gorgeous *Pleurotomaria adansoniana* (and I am not sure about this classification) trawled by a Japanese boat off Para in the COA '88 bourse: either someone's not telling the truth about the provenance or there is something new going on there!

Some good deep water material was found off São Paulo state in 1988. Most of the shells were collected from waters 300-600 meters deep. Many species were described, like *Thala crassa* Simone, 1995; and many others will be described. Even in shallow water there are so many interesting species, especially micro mollusks, to be studied. Just remember, Dr. E. Petuch visited Brasil in 1979 and he found in a few weeks a great number of new species, like *Cyphoma macumba* (then considered *C. gibbosum*), *Dermomurex oxum*, *Muricopsis oxossi*, the rare volute *Plicoliva zelindae*, etc., most of them in shallow water in the Abrolhos Archipelago.

Prof. Rios listed in his last book 1574 species of mollusks here. Since his book was published, another 30 or 40 new species were described from the Brazilian coast. Probably with serious work it will be possible to find many more new species.

SIDE BY SIDE "IN THE FOOTSTEPS OF DARWIN"

by Lynn Scheu, as told by Emily Vokes



Emily Vokes in 1959

Few professionals in the malacological world have given so much to the study of mollusks past and present as have that indomitable malacological duo, the Drs. Vokes. Harold and Emily between them have amassed some 90 years in pursuit of mollusks, fossil and recent, bivalve and gastropod, their relationships and evolution. A count of the miles traveled around the globe in this quest would be staggering. But even more staggering is the thought of the future in shell collecting without the Vokes as a part of it. Harold has been retired, both officially and unofficially, since the late 1980's and Emily retired from teaching this past December. We shall miss them terribly. With our debt to them in mind, we pay this tribute to Malacology's legendary duo, Harold and Emily Vokes.



Harold Vokes, 1963

Harold Ernest Vokes was born June 27, 1908, just across the river from Detroit, in Windsor, Ontario. Here he had a normal childhood and an excellent Canadian primary school education. One of his favorite stories is of the January day when the temperature dropped to (he says) 20° below (the snow was always deeper in those days) and the Detroit River froze solid. His father worked for the Detroit newspaper and, with no bridge, no tunnel and no ferries running, he had to walk across the river on the ice to get to work (obviously the paper had to come out, regardless of the weather!). When he got home that night he announced to the family they were moving to California!

So at age 12, Harold found himself in sunny Pasadena, where he went on to Pasadena High School, and then Occidental College in Pasadena. Here he planned to major in English and be a newspaper man like his father, but the university curriculum committee felt that a good liberal arts degree required at least one science course, and so history was swayed! Harold, like so many students today, opted for geology in preference to Physics or Chemistry and, once in the course, he discovered that Geology was what he had really wanted all along.

After graduation from Occidental in 1931, he worked under Bruce Clark in Paleontology at the University of California, Berkeley. Bruce must have recognized something special in this callow youth, for he put Harold onto a project involving clams — Harold's consuming passion from that day on. His dissertation was on the fauna of the Eocene Domingene Formation and he received his PhD in 1935. Note those dates: Harold attended graduate school in the midst of the Great Depression — in fact, the commencement speaker at his Occidental graduation spoke on "The Challenge of the Present Economic Crisis." Immediately following the commencement address, the choir rendered "Sleepers Awake" ("So help me," insists Emily, "I am not making this up!")

One Saturday while Harold was a graduate student at Berkeley, a very shy young lady came in seeking help with identification — she'd felt the need for a little R & R after completing her PhD in Psychology, and had spent a couple of weeks on the beach collecting seashells. It seems he was the only one around that day, and thus, Myra Keen said, it was Harold Vokes' enthusiasm and love of the subject that convinced her to make malacology her life's work.

While a starving graduate student (two apparently can live as cheaply as one!) Harold married Gertrude Dutton Lawrence. (The marriage was to last until Harold moved to New Orleans

to begin teaching at Tulane.) Between 1938 and 1949, they produced four children — Ann, Rosina, Frances and Arthur. The three girls subsequently married college professors (who says environment isn't important?) and Arthur became an archaeologist.

Graduating into the midst of the depression and finding himself unable to get a job, Harold hung around Berkeley as teaching assistant for a Yale professor who was there teaching a summer course. Sufficiently impressed, the professor arranged a post-doctoral course for Harold at Yale the following year. Here the young Californian, never having seen a fossil older than the Cretaceous, had the opportunity to study the Paleozoic with the great Carl Dunbar. Dunbar was, in his turn, impressed enough to recommend Harold for a position in Paleontology at the American Museum of Natural History in New York.

While at the American Museum he got to go on some exciting trips to Lebanon (and Vokes tales about that trip could fill a book!) but he spent much of his time writing articles for *Natural History Magazine*, where his former English major obviously served him well.

Off to serve his country in World War II, Harold joined not the Army but the U.S. Geological Survey, where he spent several wonderful years supposedly looking for oil under the Columbia River lava flows ("Sometimes I wonder how we did win the war!" remarks Emily). He did have a great time trout fishing, and did his part to make the world safe for democracy hunting uranium in the Green River desert of Utah.

Once the war was over, he accepted a position at Johns Hopkins University, where he taught for about ten years, until he caught the eye of the Graduate Dean at Tulane University. In 1956 the longtime chairman of the Geology Department at Tulane was about to retire, and the University decided it was a great opportunity to expand the department. They wanted a senior scientist with an established reputation to come in and essentially create a department from scratch. When Harold arrived in New Orleans in September, 1956, the geology department had three faculty members and no graduate program. Within three years it had seven faculty members and a thriving graduate program with a dozen or so students.

And at that moment the stars were poised: enter Emily, somehow just at the right moment.

Born in Monroe, in northern Louisiana, May 21, 1930, Emily Hoskins moved with her family to New Orleans in 1938, making her almost a native New Orleanian. Growing up in the swamps of Louisiana is not exactly conducive to inspiring an interest in Geology, but Our Emily was fortunate

to have a grandmother who lived in rural Pennsylvania and a father who was considerate enough to send his wife and young child off to nice, cool Pennsylvania for three months every summer. (Remember, this is pre-airconditioning!) There Emily Hoskins climbed hills, collected rocks and became entranced by the natural world in general, fashioning a love that was later enhanced by summers at a girls' camp in the Smoky Mountains of North Carolina.

When time came to go to college, off she went to Newcomb, the female undergraduate college of Tulane University. Like so many other freshman students, she did not have a CLUE as to what she wanted to do when she grew up! So, after one semester, she dropped out and entered the "work force," doing a variety of things until she landed a job as a lab technician in the Biophysics Laboratory at Tulane University in 1951. One of her first tasks there was periodically to go over to the Geology Department and pick up for repair the sickly Geiger counter (does anyone remember those?) that the

forementioned head of the department used to demonstrate radioactivity to mineralogy classes. Being an opportunist she began taking her rocks (collected in Pennsylvania and North Carolina) to him to identify in exchange for Geiger counter services. After a while he suggested that maybe she should take a course in Introductory Geology so that she could identify her own damned rocks!

Like Harold, Emily realized after one course in Geology that this was what she had been looking for all her life, even before she had known it existed. At age 25 or so, she didn't feel she could ask her family to pay for a return to full-time study; however, one of the fringe benefits of working for Tulane was her right to take courses free of charge. Thus Emily was able to take her first few Geology courses while working full time in the Geophysics Lab.

By 1956, when Harold arrived on the scene at Tulane to take over the department, Emily was a part-time undergraduate geology student. Discovering Emily's burning

(Continued on page 12)



Sitting Bull Falls,
New Mexico,
August, 1959



Chichen-Itza,
Merida,
Yucatan,
December
1963



Malinalco,
Mexico,
June 1968



Grand
Canyon,
Arizona,
September,
1970

SIDE BY SIDE "IN THE FOOTSTEPS OF DARWIN" (Continued from page 11)

desire to be a geologist, Harold arranged for her a work-study scholarship for tuition and a part-time job as curator of fossils, and so she became a full-fledged geology student. It should be noted that at this time her main interest was in Geomorphology (the study of landforms), and that Paleontology was just another course to be taken in the curriculum. BUT, Harold taught the course and somehow she quickly realized that Paleontology was much more exciting than ANYTHING else. (However, she never lost her interest in Geomorphology and in the coming years what she would teach at Tulane was almost exclusively geomorphology, under the disguise of Geography!)

Having successfully passed Paleontology, and recognizing that Harold and she were two people who were truly meant for each other, Emily became Mrs. Harold Vokes in March, 1959, and graduated with a B.S. in Geology in May, 1960, incidentally becoming one of two females to graduate from Tulane's College of Arts and Sciences, the male half of the University, as Newcomb women were not permitted to major in Geology!

Graduate school followed, and when it came time to decide upon a research topic, Emily chose the group of gastropods (since Harold already had the market cornered in bivalves) that she felt was the most beautiful in the world and learn everything she could about them. And so it was that the family Muricidae became the subject of her research for the next 35 years.

Harold and Emily worked as a team, primarily collecting the faunas of the western Atlantic Cenozoic. Every Thanksgiving and Christmas, Easter, Mardi Gras (after all, this WAS New Orleans) and summer vacation found them collecting, in the south when it was cold, in the north when it was not.

One of the endeavors associated with upgrading the Geology Department involved the need for a Summer Field Camp in Geology for the students. At this time the Instituto de Tecnológico de Monterrey ("Monterey Tec") was encouraging U.S. universities, especially Tulane, to make use of their beautiful facilities during the summer months. So what was more natural than a summer field camp taught in northern Mexico? For some years the Vokes taught field camp for the first six weeks of the summer, and then spent the rest of the summer traveling throughout Mexico, collecting fossil and Recent mollusks and learning to love the Mexican people, culture, food, countryside and archaeological sites.

In 1964 the road was newly opened all the way to Yucatan (before that you could not drive there) and, naturally, the Vokes headed to the end of the road. Living in Merida at this time was Tulane's Archaeologist-in-Residence, the late Bill



Macchu Pichu, July 1978

Andrews who, in addition to his archaeological studies of Yucatan Mayan sites, was very involved in a study of the mollusks of the Yucatan Peninsula. The Vokes soon became members of his marvelous extended family, and one of the prerogatives of membership was the opportunity to join the family in their annual Christmas festivities. For 14 years the Vokes loaded their vast International Travelall with the Andrews' latest shopping list, which might include anything from fresh horse-radish root and Dream-whip (not available in Yucatan) to an inflatable rubber raft, in which, they succeeded in convincing the Mexican customs officials, they were going to go fishing, and made the 2500 mile drive to Merida (600 miles by air!) The for a month they would enjoy wonderful Mexican hospitality, culminating in a stay at some strange beach, different every year, where the Andrews would rent a house for the week between Christmas and New Years. The ultimate outcome of all this fun was the *Distribution of Shallow-Water Marine Mollusca, Yucatan Peninsula, Mexico* (Middle Amer. Research. Inst. Publ. 54, 1983).

In 1968, they discovered the rest of Central America by driving from New Orleans to Panama (the various countries were a lot more stable politically then), collecting the fantastic fossils of the Moin Formation in Costa Rica and the Gatun Formation in Panama, as well as scouring the many tropical beaches. [Conclusions drawn from this and future Central and South American field work bore fruit in their writings for years to come. Publication of a joint Vokes bibliography is planned in a future issue of *American Conchologist*.]

Their love of Latin America was expanded even more by an opportunity to spend a semester teaching at the Universidad



Almost Cape Horn, Argentina, January 1987

Federal do Rio Grande, in Porto Alegre, Brazil, in Fall, 1971. As classes ended at Tulane in May but did not begin until September in Brazil, there was time for a leisurely trip through Brazil from north to south. After the end of the semester, about the first of December, they took another six weeks to travel south through Argentina, then back north along the west coast through Chile to Peru. One of the more tangible results of their trek around South America is their publication, "In the footsteps of Darwin" (*Tulane Studies in Geology and Paleontology*, v. 17, 1982). Thoughts of Darwin and his discoveries surely accompanied these two geologists/paleontologists on their voyage, as they walked where Charles Darwin walked and photographed what he saw. Some of these photos illustrated their Darwin publication ten years later.

A less tangible result of their South American travels was a passion for all of South America, which led to several additional trips to Argentina, Chile, Peru and, especially, Ecuador. The latter became a particular favorite due, in part, to its sheer delightfulness, Emily notes, but also to the presence of the Esmeraldas fauna exposed in the seacliffs of the northwest coast.

For some time they longed to collect in the Dominican Republic but this was not a very good idea until 1976, when political stability was finally established in that troubled country. One trip and they were hooked! The collecting was the best that they had encountered ANYWHERE, and for the next ten years they spent at least three weeks each summer, and occasional holidays, exploring this treasure trove of Neogene mollusks. However, they were not the only ones who had their eyes on the Dominican Republic. At the same time they were collecting there, a group under the direction of Peter Jung, from the Natural History Museum of Basel, Switzerland, had received a large grant to do a multi-disciplinary study of the area, with micro- and mega-paleontologists, sedimentologists, cartographers, etc. Learning of each others' activities, they pooled their resources and the results of both collections are being utilized by a variety of workers in series of monographs on the paleontology of the Dominican Republic, published by the Paleontology Research Institution, Ithaca, New York.

In 1980 a Visiting Curatorship at the Australian Museum in Sydney introduced our intrepid travelers to the wonders of the land "Down Under." The first visit was about four months long and, although they spent most of the time working at the Museum, they were able to make a couple of trips to such attractions as the Great Barrier Reef and Ayers Rock. But this vast country cannot be covered in any one trip, so they made several subsequent visits, exploring virtually all of this amazing place. Their main concentration was the collecting of Recent mollusks, but they also investigated beautiful Neogene fossils in the southeastern part of the continent, providing additional material for research.

Other trips have taken them to every continent, to most of western Europe and the Mediterranean, parts of Africa and the Far East, every country in South and Central America, every state in the U.S. and Mexico, and almost every province in Canada (they never made it to Northwest Territory). Their last major trip was to Antarctica over Christmas 1993-94.

Their body of research and writing about mollusks is immense. Helping start *Tulane Studies of Geology and Paleontology* (originally *Tulane Studies in Geology*), Emily contributed her first paper to its pages in July, 1963, "Cenozoic Muricidae of the western Atlantic, Part I — *Murex sensu stricto*," and it was to be Part I of a series of twelve, the most recent of them with Geerat Vermeij, "The Subfamily Ocenebrinae (in part)" published in February 1997. (*Tul. Stud. Geol. Paleont.*, 29(3) 69-118.) She was Associate Editor from



On the occasion of Harold's 88th birthday, June 27, 1996

1970 - 1986, and Editor from 1986 to the present. Emily has contributed nearly 60 articles to its pages, mostly on the Muricidae, and Harold, 35. In addition the two have been published in *Nautilus*, *Veliger*, *Journal of Paleontology*, *American Museum Novitates*, *Natural History*. In recent years, Emily has been a member of the *American Conchologist* Editorial Board and a frequent contributor to its pages, as well as a banquet speaker at the 1988 COA Convention in Fort Myers.

Harold taught full time at Tulane from 1956 until 1973, when, at age 65, he was required by Tulane to teach only part-time. At this time Emily became a full-time member of the Geology faculty as his replacement. (She had been teaching part-time as a Geography Instructor since 1969). At age 70, Tulane rules said that faculty were absolutely out! Retired! But of course Harold fooled them, and kept on teaching without pay for another ten years of so. Emily recently accepted the University's generous sizing-down buy-out and is retired as of December 1996. Between them, the Vokes represent a 40 year period of teaching at Tulane University and devotion to the fossil and Recent mollusks of the world, both bivalve and gastropod. In addition, Harold served as Departmental Chairman for ten years (1957-1966; 1970-1971) and Emily served as Chairman for eight years (1974-1982), plus Acting Dean of Newcomb College for one year.

In those 40 years, these insatiable collectors amassed tremendous collections, the extent of which is apparent when one looks at the locality registers. The fossil collections at Tulane are numbered in chronological order, starting with TU-1, a post-Pleistocene marine exposure from an excavation for a highway in New Orleans East, collected in 1957. As of today, there are 1546 localities, mainly Cenozoic, but there are a lot of geologically older sites as well. At the same time they have also collected 365 Recent localities, from Greenland to Antarctica, although most are more tropical! What will become of those collections is a matter of great concern, and there are ongoing discussions with a variety of institutions, but as of this writing, no decisions have been made.

Harold and Emily are fully retired now, and are moving into their new (old) home across the lake from New Orleans, in historic Ponchatoula, where we in the world of mollusks hope they'll continue to be part of our community to which they have already given so much. But will they have time? Word is that Emily, always a fancier of old things, is about to launch a second career as an antique dealer!



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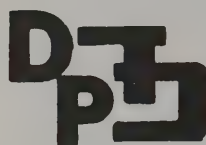


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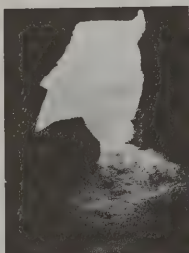
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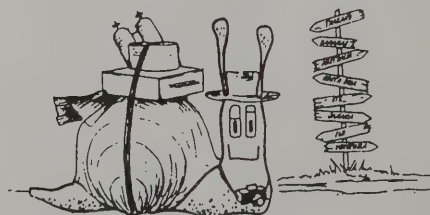
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BOOK REVIEWS

Les Muricidae d'Afrique occidentale by Roland Houart. Brussels, 1996. 1. Muricinae & Muricopsinae. Apex 11(3-4):95-161. Available from the Societe Belge de Malacologie, Av. Mozart 52, 1190 Bruxelles, Belgium. Price 700 Belgian Francs + postage (approximately \$25.00).

Astronomers tell us that a black hole lurks in the center of the galaxy. For those of us interested in the Muricidae, that black hole is much closer—western Africa. We knew there were a lot of species there, but getting them has not always been easy. And identifying them was worse. Pursuing the standard works, one gets the feeling that everyone was just guessing. Until now. This is the first of a two part review of the west African muricids by the heir apparent to the Murex throne, Roland Houart. This part deals with the Muricinae and Muricopsinae. Part two will cover the remaining subfamilies. Both will be indispensable to anyone interested in this group.

Western Africa has several well-known and impressive species—*Bolinus cornutus*, *Purpurellus gambiensis*, *Homalocantha melanamathos*, *Muricopsis bojadorensis*, etc. But west African muricids also have two major problems—*Hexaplex* and *Muricopsis*. The area has a high diversity of both, and the species are difficult to tell apart. Anyone familiar with muricids is aware of the traumatizing mess known as *Hexaplex saxatilis*. Or is it *hoplites*, or maybe *turbinatus*, or perhaps *bifasciatus*, or *rosarium*, or *duplex*? Houart recognizes *duplex*, *rosarium*, *angularis*, *bifasciatus*, *megacerus*, *varius*, and *saharicus* as good species—a lot of *Hexaplex*! (The western Atlantic Ocean also was once *Hexaplex*-rich, but the majority are extinct). Most difficult to differentiate are *duplex* and *rosarium*, which are both variable species. Despite a table putting forth the differences between the two, I still have problems fitting Houart's figures to his scheme. Figure 60 looks a lot more like *duplex* than *rosarium*.

The muricopsines are equally diverse—10 taxa are recognized, many recently described and from small zoogeographic areas (particularly São Tomé). You might want to wait for part 2, which will cover the ergalataxines, before you identify these small species. The genus *Prodoxa*, known from two species from São Tomé, is removed from the Buccinidae and relegated to the Muricopsinae. At under 5 mm in length, these species are among the smallest muricids known.

Sixty-six nominal species are covered, but no new taxa are proposed. In what will be a controversial move, he has synonymized *Hexaplex clausii* with *varius*. In the we-knew-it-all-along department, he has synonymized *Murexiella asteriae* with *bojadorensis*. The long lost and extremely rare *Subpterynotus exquisitus*, described from an unknown locality, is finally identified as a member of the Western Sahara fauna. But don't expect it on lists anytime soon. Vokes had suggested that the eastern Atlantic Ocean might be its home, while hoping it would turn up in the western Atlantic. Sorry, Emily.

This is the usual high-quality work we have come to expect from Houart. Radulae and protoconchs are illustrated as well as the shells. The photography is much better than some of his earlier works. As usual, Houart is a man of few words, and we wish he would expound a bit more in places. The text is in French, but there are English "Remarks" for all species, though the French "Remarques" are often longer and more informative. I highly recommend this work - it was sorely needed.

— G. Thomas Watters

Ohio Biological Survey & Aquatic Ecology Laboratory, Ohio State University, 1314 Kinnear Rd, Columbus, OH 43212-1394 USA

Freshwater Mussels of Texas. Edited by Robert G. Howells, Raymond W. Neck, and Harold D. Murray. University of Texas Press, Austin, TX, 244 p. 144 color and 110 b/w illus., 52 maps. 8" x 11". Softbound. \$29.95 + \$3.00 s/h.

Freshwater Mussels of Texas is the latest of several state publications documenting the distribution and biology of the pearly freshwater mussels, bivalve mollusks of the family Unionidae. This attractive publication begins with a well-illustrated introductory discussion covering biology and anatomy of this unique family. We learn that, though this family has been around for some 400 million years, and the U.S has the richest fauna in the world (some 300 species), they are little known to the public, even to shell collectors. Unfortunately, they are rapidly disappearing due to many factors. Nearly half of the species are extinct or federally listed (or proposed to be listed) as threatened or endangered.

One reason that they are poorly known is their close resemblance to one another, to the extent that it often requires one experienced in the field to identify specimens. A serious student and collector of unionids since 1974, I cannot identify some specimens. Until recently there have been no popular or even scientific publication with descriptions and figures of these animals. One often has to resort to original 19th century works.

The publication of *Freshwater Mussels of Texas* admirably fills this need, at least for Texas, in a comprehensive fashion. It is the product of a huge effort by the Texas Parks and Wildlife Department at the Heart of the Hills Research Station, and by chief author, Robert G. Howells. Since 1992, he and his associates have thoroughly surveyed the unionids of the state, a prodigious feat because Texas is a large state with over two dozen major rivers.

In this treatment, the only work on Texas mussels since Strecker in 1931, 52 species are systematically described and figured. Each has a synonymy, distribution, description and habitat section, plus information on biology (larvae, larval hosts and spawning), general comments, and a note about economic importance. Some of the biologic and distribution data are as yet incomplete, especially sophisticated studies such as electrophoretic data. Following the systematic section are a glossary, reference-list, index, appendix and a new section of attractive color plates.

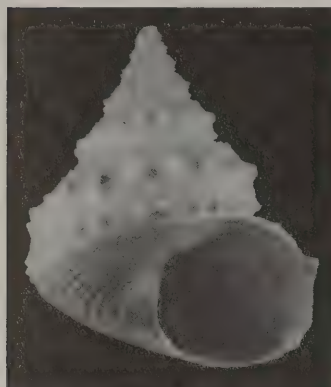
Despite the size of Texas, several other states have many more species. However, we learn that the 52 species inhabiting Texas have a large proportion of unique or endemic species (Some 19 are state or regional endemics, and are here figured in most cases for the first time in popular literature). There are no less than 10 species of the interesting genus, *Quadrula*, which features interesting sculpture. I personally have become so fascinated with this unique fauna that I have made field trips to Texas.

The book's main drawback is that the quality of the black and white illustrations render it difficult to make out certain features. The beautiful color photos in the back of the book are much better but, alas, they are too small, 3 X 5 cm. The expense of color reproductions undoubtedly led to this compromise in order to make this book affordable at \$29.95. Some scientists might quibble over some of the taxonomic treatments, but the entire field of taxonomy is in a state of flux, mainly owing to the advent of genetic studies. This work is an excellent first step. Hopefully Bob Howells and his associates will eventually come out with another edition with improved illustrations and also catch us up with the tremendous amount of distributional and biologic data they have discovered since this book was written in 1994.

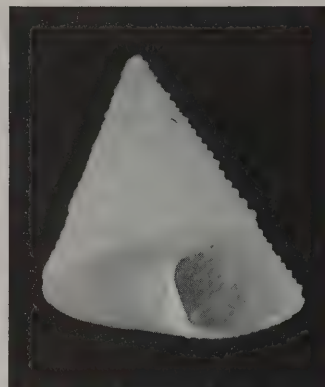
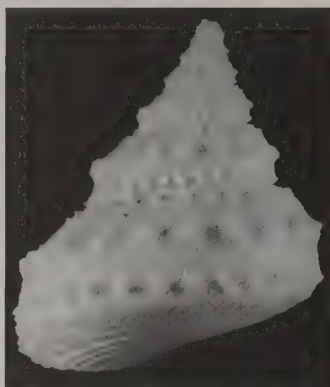
— W. Henry McCullagh, M.D.

CARIBBEAN CALLIOSTOMAS

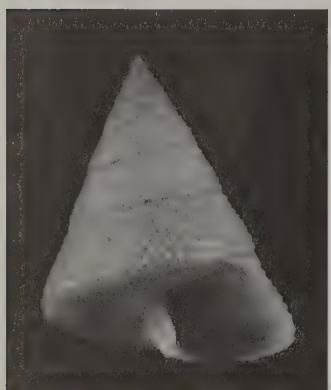
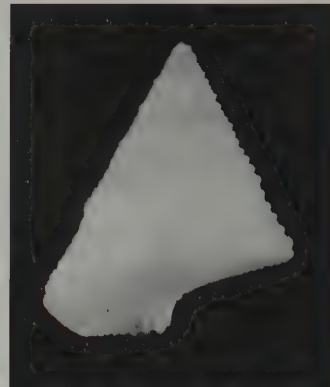
by Kevan and Linda Sunderland



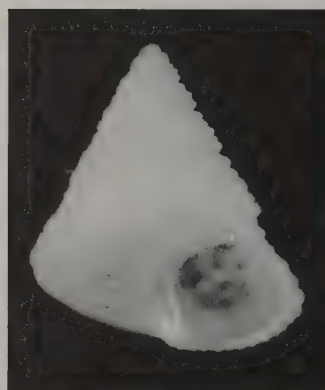
Lischkeia imperialis (Dall, 1881). 43mm. 500', trapped off St. James, Barbados.



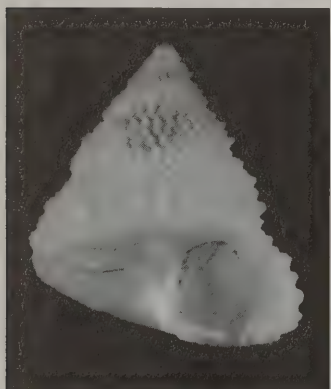
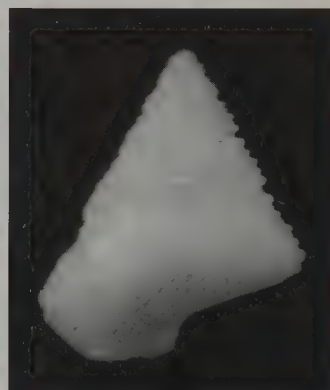
Calliostoma apicinum Dall, 1881. 8mm. 500', trapped off St. James, Barbados.



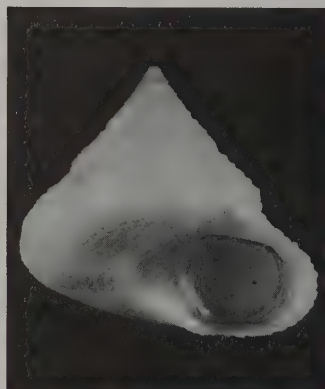
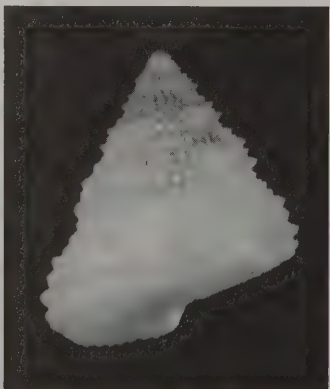
Calliostoma bermudense Quinn, 1992. 8mm. 150 fms., off Bermuda.



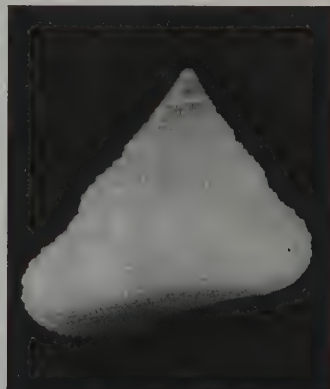
Calliostoma carcellesi Clench & Aguayo, 1940. 5mm. 400 m., Southern Argentina.



Calliostoma echinatum Dall, 1881. 6mm. 30 m., Espirito Santo, Brazil.



Calliostoma euglyptum (A. Adams, 1855). 19mm. 90', off Destin, FL by diver.



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Clench, W.J. and R.D. Turner. 1960. The genus *Calliostoma* in the Western Atlantic. *Johnsonia* 4(40): 1-80.

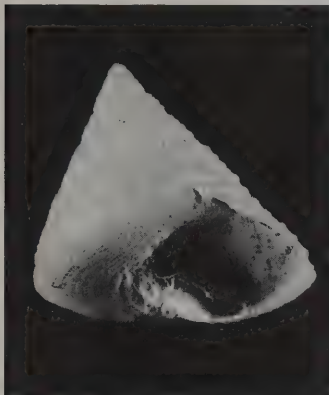
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*See also

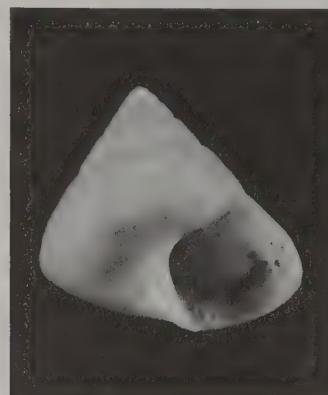
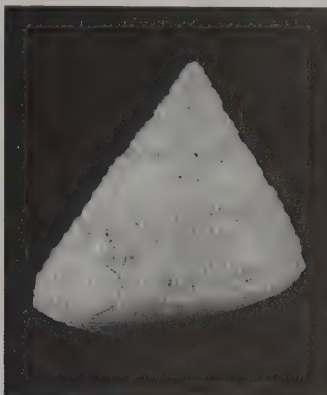
"Caribbean Calliostomas" - Part I *American Conchologist* 17(3) 12-13, Sept 1989

"Caribbean Calliostomas" - Part II *American Conchologist* 24(4) 16-17, Dec 1996

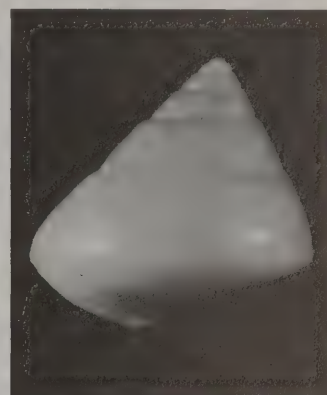
Disclaimer: The intent of these centerfolds is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



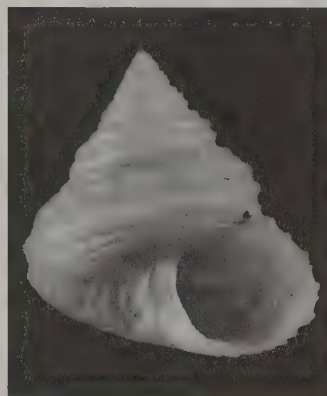
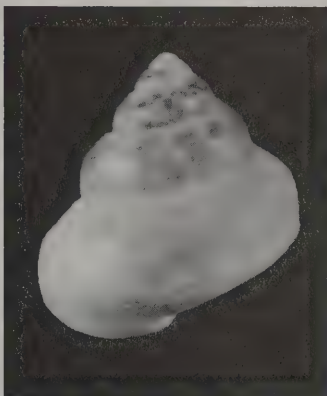
Calliostoma jucundum (Gould, 1849). 7mm. 30 m., La Paloma Rocha, Uruguay.



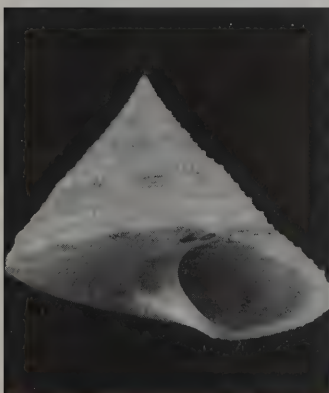
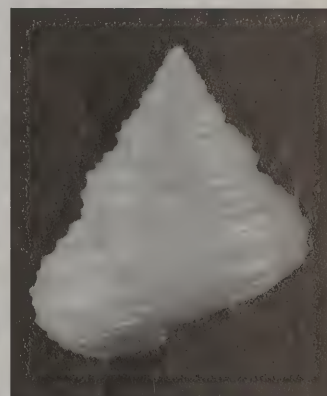
Calliostoma modestulum Strebel, 1908. 10mm. 200 m., Sur Isla de Lobos, Uruguay.



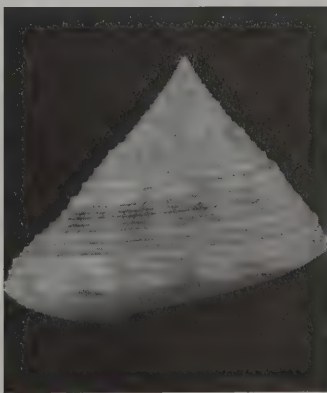
Calliostoma nordenskjoldi Strebel, 1908. 10mm. 200 m, Sur Isla de Lobos, Uruguay.



Calliostoma occidentale Mighels & Adams, 1842. 43mm. 44 fms., off George's Bank, Nova Scotia.



Calliostoma oregon Clench & Turner 1960. 24mm. 170 fms., off Key West, FL.



Calliotropis otto (Philippi, 1844). 7mm. 480 fms. off Martha's Vineyard.



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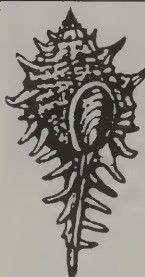
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KNOW YOUR MURICIDAE

by Betty Hunter

It is with a considerable measure of sadness that we bring you the most recent Betty Hunter shell quiz. Betty, who had been suffering ill health since September, died quite suddenly of a heart attack in early December. See Dr. Harry Lee's tribute to Betty on page 27. And enjoy your quiz. There is only one more of these immensely popular, clever and erudite little tests of our shell knowledge to come.

Note: Answers may include validly proposed names which have been relegated to synonymy, sub-specific names, and forms.

1. What species of the genus *Chicoreus* might be engaged in the timber industry?
2. What member of the genus *Dermomurex* would have a keen interest in the grain industry?
3. What member of the genus *Homalocantha* mentions a nocturnal arachnid with a venomous sting?
4. What species of *Dermomurex* might be an excellent proofreader of paragraphs?
5. What species of *Dermomurex* and *Aspella* each mention a different form of Egyptian architecture?
6. What member of the genus *Naquetia* immediately suggests a religious order of monks and a species of monkeys?
7. What rare species of *Pterynotus* suggests a lighthouse visible throughout the night?
8. What species of *Phyllonotus* suggests a two-family dwelling?
9. What murex suggests a person who is bat-brained or batty?
10. What murex suggests a fluent, clear speaker?
11. What *Murexiella* species name sounds like that of a serious liver ailment?
12. What species of *Siratus* sounds like the name of a southern state?
13. What species of *Favartia* names a mythical monster which was half-man and half-bull?
14. The genus *Aspella* boasts a set of twins. Homer describes one as good at boxing and the other as good at taming horses. Who are they?
15. What species of *Favartia* was almost certainly a pauper?
16. What species of *Aspella* is mysterious and often shows a perplexing brevity of expression?
17. What species of *Chicoreus* bears the name of the Greek goddess of hunting and wild animals?
18. What species of *Haustellum* suggests a woollen fabric usually made in a twill weave?
19. What genus and species of Muricidae names both the composer and title of a French opera?
20. What species of *Litozamia* is among Santa's most famous employees?
21. What species of *Chicoreus* reminds one of a religious order named after its founder?
22. What species of *Murexiella* appears to be a member of Spain's lower nobility?
23. What species of *Chicoreus* suggests a special kind of brown cardboard?
24. What species of *Haustellum* names a twentieth century U.S. President?
25. What species of *Nipponotrophon* names a monster slain by Perseus?

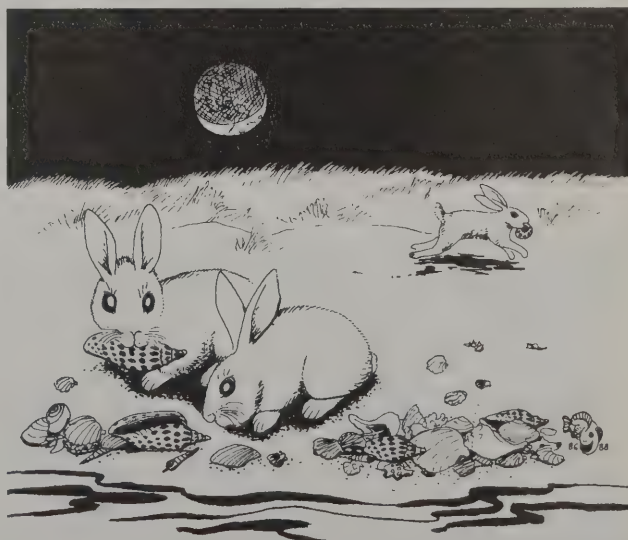
Answers in June 1997 issue.

AMU/WSM MEETING IN SANTA BARBARA JUNE 22-27

The 63rd Annual Meeting of the American Malacological Union will be held at the Radisson Hotel on the beach in Santa Barbara, CA, Sunday, June 22, to Friday, June 27, jointly with the Western Society of Malacologists. Two major symposia are scheduled: Traditional vs. Phylogenetic Systematics, convened by Gary Rosenberg [Malacology, The Academy of Natural Sciences, Philadelphia; and Deep-Sea Mollusca, convened by Jerry Harasewych, National Museum of Natural History, Washington, DC, an overview of the fauna of the deep sea and what it tells us about the evolution of the Mollusca and its adaptation to the deep sea. There will also be a special session on the Cephalopods of the North Pacific chaired by Eric Hochberg [Invertebrate Zoology, Santa Barbara Museum of Natural History.

Entertainments include a reception on the beach across from the hotel, a visit to a winery in the Cachuma Valley, and a banquet at the Santa Barbara Museum. Optional field trips on the 27th include a tour of fossil formations of the Santa Barbara area led by Lindsey T. Groves of the Natural History Museum of Los Angeles County, a cruise to the Channel Islands, and an in-depth tour of the Santa Barbara Museum of Natural History. For more information, contact: Eugene V. Coan, President, AMU, 891 San Jude Avenue, Palo Alto, California 94306-2640 Phone: (415)493-8242 (H); 977-5681 (Office — generally M, Tu, Th); fax: (415) 977- 5799 Email: gene.coan@sierraclub.org OR Henry Chaney, President, WSM, Invertebrate Zoology, Santa Barbara Museum of

Natural History, 2559 Puesta del Sol Road, Santa Barbara, California 93105 Phone: (805) 682-4711, ext. 334; fax: (805)569-3170. Email: inverts@sbnmh.rain.org



John Timmerman

One reason Junonias are rarely found washed up on beaches.

BOOK REVIEW

Common Seashells of Coastal Northern Queensland by **Patty Jansen**. Privately published, Townsville, Australia, Nov. 1996. 4 + 56 pages, 4 color plates, 116 line drawings 6" X 8" Paper. About \$14.00 U.S.

Patty Jansen who lives in Townsville, Queensland, loves shells and beaches: "The beach always holds some surprises and shells are part of this. Northern Queensland beaches are usually quiet. There are no huge pounding waves and large numbers of sunbaking tourists, just mangroves, a large sandflat and sometimes a small rocky outcrop." So begins the introduction of the little guide she has written for beachwalking shell collectors, in northern Queensland, that is.

The cover, front and back, of this attractive little paperback features a wide-angle photo of broad sand flats on a beach. Three Mile Creek Beach just north of Townsville, which is superimposed with photos of the five species of *Strombus* common there. The shells she illustrates are the common ones, the small ones, and the inshore bivalves among the fauna of this tropical western Pacific region, the ordinary shells that a beachwalker is likely to find and perhaps have trouble identifying. Most of the eighty or so shells photographed in her four color plates are beach specimens. There are also over 100 of Patty's excellent line drawings of beach findings.

She uses common names for the families so some of them are unfamiliar to Americans: the creepers and cluster whelks, the sugar limpets, pupa shells and the little pipis. But scientific names are there too, with authors and dates, as well as sizes and descriptions of features not clearly visible in the illustrations, and also the ranges of their occurrence in Australia. A contents, an introduction, a complete index, a book list for further reading and a list of Australia's shell clubs complete this practical and inexpensive little addition to the literature on Australian marine mollusks.

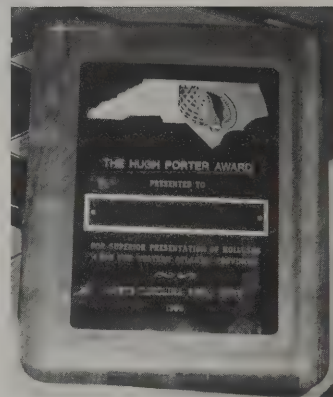
Patty Jansen, author of the new *Guide to Shells of Northern Queensland*, with son Jordy, born in September. Jordy has the distinction of being the first baby born to a Conch-L subscriber!



A NEW TROPHY FOR NORTH CAROLINA

by Ann Buddenhagen

On June 7, 1996, the Board of Directors of the North Carolina Shell Club approved the creation of a new trophy to be awarded at future North Carolina Shell Shows, in honor of Hugh Porter, long time club member and marine sciences professional. Hugh has worked for the University of North Carolina Institute of Marine Sciences for 41 years, and authored the pamphlet, *Sea Shells Common to North Carolina*, soon to be released in a new updated and expanded edition.



As a charter member of the North Carolina Shell Club, Hugh Porter has contributed greatly to the success of the Club since its formation in 1957 with his knowledge, enthusiasm and support, especially in his current capacity as Club Historian. The Club, in turn, wishes to honor Hugh for his efforts on behalf of malacology in general and the molluscan fauna of North Carolina in particular.

The Hugh Porter Award will be presented to that exhibit at the North Carolina Shell Show best advancing knowledge of molluscan fauna of the Western Atlantic provinces — the Boreal, Virginian, Carolinian or Caribbean faunal provinces. All eligible shells must actually have been collected from these provinces in any manner other than from shell dumps. Exhibits will be judged on accuracy of scientific labeling and data, completeness of representative fauna, biological observations, natural history, and other aspects of professionalism in exhibit quality. Collectors everywhere are encouraged to compete for the prestigious new award.

At the November 15-17 North Carolina Shell Show at Wilmington, club President Mark Johnson's fine exhibit received the first Hugh Porter Award, setting an excellent standard for the future. Mark's 35 case exhibit, entitled "Seashells of the Southeastern United States," presented over 300 species of gastropods and bivalves he collected from North Carolina south to the Keys. Photographs underscoring biological observations such as breeding and laying of egg capsules highlighted his exhibit, and he focused also on the natural history of the regions and the effect of the Gulf Stream on offshore North Carolina species.

WE NEED COA AUCTION ITEMS

The 25th Anniversary COA Convention will be held July 13-18 on Captiva Island, Florida. The Annual auction held during the Convention is the Major Fund Raising event for COA. The proceeds go primarily to fund our very important educational grants program.

Donations are needed for the Oral and Silent Auctions, Door Prizes, and Raffle. As the 1997 Auction Chairperson, I am requesting your support. **Donations of rare shells, specimen shells, shell books, shell art, and any shell related items would be greatly appreciated.**

All donations should be received no later than **June 1, 1997** if possible. This will allow sufficient time to prepare donations and compile the auction list. Hope to see you all in July. Please send donations to:

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(941) 472-4094

THE PHILIPPINE SHELL EXPORT BAN — A DECISION FOR THE FILIPINOS

by Donald H. Y. Dan

Long known as a molluscan mecca because of the amazing number and variety of marine shells living in the waters which surround this tropical island nation, the Philippines is a country of prime importance to the shell world. Few collectors have no Philippine shells, and most know of many Philippine species they would like to acquire. Last November, the surprising news of a proposed ban on Philippines shell exports was released, causing much concern in the conchological community. The news spread rapidly via the internet and Conch-L, and nearly everyone has an opinion.

Like many legislative processes, it took a while for those people directly affected by the legislation to become aware of it. Bill No. 3023 was presented for its third public hearing in Manila in October 1996 when, for the first time, a significant number of the shell dealers from Manila and Cebu were present. The scientific community was not represented, and since the shell collectors' circle in the Philippines is nearly nonexistent, there was no voice representing amateurs. The bill's advocates seemed to focus on fear of diminishing shell resources. No scientific evidence was presented to support such fear. Only anecdotal comparison with fish overkill was brought up, and the opinion that shells are a Filipino national treasure which, therefore, need protection from foreign demands.

Opposition views were expressed mainly by the shell exporters at the hearing, but their lack of preparedness was quite obvious: no statistical information or anecdotal evidence to support the opposition's views was presented. These omissions can be attributed in part to this being a first encounter of the shell dealers with such a political process. A prolonged attempt to define and distinguish between specimen and commercial shells was made without success. The session ended with shellcraft excluded from the ban, and the hearing continued into a fourth session, to be held in Cebu City, the center of the Philippine shell trade. As of this writing, no date has been set.

Lessons learned at the third hearing mobilized the shell exporters in Cebu into a more organized group. Preparations for the upcoming hearing are being made by the Cebu Chamber of Export Industries; among them David Sharpe, their vice president, appears most vocal.

In Manila, Manuel Montilla, a local specimen shell dealer, has been most active in developing an opposition platform. A trained lawyer, he has filed a brief protesting the bill, based on the constitutional guarantee of the right to the pursuit of one's livelihood. Many Filipinos base their income on shell exporting. This bill will deprive them of their rightful means of livelihood without due process. Due process could mean, for example, that each species of shells that is fished would have to be determined individually to be endangered.

Due to the island geography and its tropical location, the Philippine Islands have a rich marine fauna few other places in the world can claim. Both the variety and the quantity of marine invertebrates are unsurpassed. The sustained harvest of shells in the Philippines has been a well-established industry for many years. The gathering of raw shells, their processing and distribution is a well-developed commerce. I might add, it is a truly self-developed Filipino business, not dominated by foreigners. The scale and the quality of the business is easily tops in the world, and the pride of the Filipinos.

Without doubt, the diligence of Filipino shellers has also produced some dramatic scientific results, including the discovery of over 200 new shell species in the last 19 years.

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We would be remiss if we failed to mention some major discoveries in cone toxin research using shells supplied by Filipinos. In fact, a whole new marine biology laboratory was established at the University of the Philippines based on this research. With collaboration from Dr. Baldomero Olivera, University of Utah, the scientific findings of this laboratory provide for vast neuroscience studies worldwide. Who would have predicted that the toxin from the lowly *Conus magus* could have the potential to become one of the most effective of pain killing drugs. It is undergoing a second year of clinical trial in the U.S. Restrictions in shell export would summarily terminate an emerging biotechnology industry and the many possible discoveries beneficial to mankind, not to mention the vast scientific and educational opportunities that would be missed.

The success of this industry has a very sound ecological basis. Most shells mature and live for 2 to 12 years. Then they die. Shellers in the Philippines, nearly without exception, focus on taking only mature and dead shells. This is dictated by the economic fact that immature shells have low value. As a result, there is always ample breeding stock left behind and a sustained harvest is a reality. Furthermore, most shells are harvested by shellers singly either by divers or through shallow water collecting. No dredging ever takes place. The shell habitat is therefore undisturbed. Limited tangle net operation takes place in a few selected areas for the catching of deep water specimen shells. Even here the ocean bottom is undisturbed. In other words, shellers do not contribute to marine ecological destruction.

The major reef destruction in the Philippines today comes about through damaging fishing methods such as dynamiting and the use of cyanide. These methods are not used to take seashells. Who would want bombed and broken shells? Increasingly also, there is evidence of algae growth due to shoreline development which produces nitrogen-rich waste, including fertilizer. Another seldom publicized fact is that the harvest of shells takes place, for economic reasons, mainly in the south central islands of the Philippines, in the Visayan provinces. Even the once exceeding rich harvest areas of the Sulu Archipelago are now seldom shelled due to the political situation. In total area, therefore, regular shell harvesting covers no more than one fourth of the total Philippine islands. Vast areas are left for undisturbed breeding, including the whole of the Luzon provinces in the north and the vast areas of Mindanao in the south.

Above all, the concern should be focused on the plight of the thousands of Filipinos whose livelihood will be wiped out for no valid scientific reason. Local dealers in shells have dedicated a great amount of effort to establishing Cebu as the undisputed center of international shell trade. Both their good reputation and the attendant economic benefits will vanish. It seems obvious that Filipinos themselves have to make that decision. Their livelihood and their pride are at stake.

FRIEDA SCHILLING COLLECTION AT THE FIELD MUSEUM

COA Member, Frieda Schilling, has given her very considerable collection (37,000 specimens) of land, freshwater and marine shells, including nearly 2,000 series of unionid bivalves, to the Field Museum of Natural History in Chicago. That collection has now been transferred to the museum, where it is available for study.

DEALER'S BOURSE INFORMATION

A DEALER'S BOURSE, which will be open to COA members and the general public, will be held during the 1997 COA Convention on July 16 and July 17, 1997. Participating dealers must be a members in good standing of Conchologists of America for a minimum of six months prior to the Convention.

Space is limited and is assigned based on receipt of payment, completed Bourse Agreement and Registration forms.

Anyone desiring information about participating as a dealer please contact **AL and BEV DEYNZER, Showcase Shells, 1614 Periwinkle Way, Sanibel, FL 33957, TEL/FAX (941) 472-1971.**

Our very warm and sincere congratulations to *American Conchologist* columnist (p. 9) and COA member from Brazil, Jose Coltro and his bride Marcia. They were married on January 25 in Sao Paulo, and celebrated their marriage with a wedding trip to Europe. (How many shell shows did you take Marcia to, Jose?) We hope Marcia will learn to enjoy the shell circuit as much as her husband Jose and her new brother, Marcus. And we also look forward to meeting her in Sanibel in July.

LETTERS:

Dear Members of The Conchologists of America,

My name is Matthew Parry and I am the recipient of a \$700.00 grant from your organization to help with costs of my research. At the time I received the grant I was a first-year graduate student in Biological Oceanography [at the University of Hawai'i] and had been applying for a number of grants so that I could follow my research interests. I am writing to applaud your efforts to make research grants available for students. It is very difficult for new students to obtain grant money for several reasons such as the paucity of grants that are available and the inexperience of the student. I am extremely grateful to COA for their help and would like to thank each one of its members personally. As this is a near impossibility I hope that this general letter of appreciation will suffice. Once again, thank you very much.

Sincerely,
Matthew Parry

The COA Index, Volumes 20-23 update, is available from COA Publications Director Betty Lipe. This update covers 1992 through 1995 and costs \$2.50. Order your copy from Betty at:

440 75th Avenue
St. Petersburg, FL 33706

If you want a copy of the *original 20-year Index* through 1991, send your order with \$4.00 to *Hank Foglino*, 4 Trent Court, Smithtown, NY 11787. Back issues are also available from Hank at \$3.00 for issues prior to 1985, and \$5.00 after that.

BOARD TALK . . .

From COA Treasurer, **BOBBIE HOUCHIN**: Thank you! Thank you! Grazie! Merci! Gracias! Bedankt! Danke! Obrigado! Many of you have paid your dues at the new rates. Some of you were not aware of the new rates but responded to a request to pay the balance due. Anyone who has **not** renewed by the time this March 1997 issue of the *American Conchologist* is mailed will **not** receive this issue until they send in their dues. Please urge anyone you know who might not have paid their 1997 dues to do so. Send them to me, Bobbie Houchin, COA Treasurer, 2644 Kings Hwy., Louisville, KY 40205-2649. Don't let them miss out on what is going on in the shell world, including the 1997 Convention on Captiva, hosted by the Sanibel-Captiva Shell Club, July 13-18, 1997. Many thanks, again — enjoy the 1997 issues of *American Conchologist*!

NEW DELAWARE MUSEUM OF NATURAL HISTORY EXHIBIT:

The WALL of SHELLS - A Celebration of Shell Diversity

The Delaware Museum of Natural History in Wilmington, DE opened their new long-term exhibit, "The Wall of Shells" on March 1. Celebrating the enormous biodiversity of mollusks, this exhibit, says new Malacology Curator Dr. Timothy Pierce, "will knock our visitors for a loop with the enormous variety and wonderful stories associated with our shells." The rare, the common, the bland, the beautiful, the facts and legends associated with the shells, all coordinate to persuade visitors that shells are not just something to kick around at the beach, but fascinating and magnificent aspects of the world around them. "A wonderful facet of this exhibit is that every time someone looks at this array of shells, they see something they missed previously," says Dr. Paula Mikkelsen, co-developer of the Wall of Shells, and now Curator of Malacology at the American Museum of Natural History. The exhibit is a gift of Museum trustee Horace K. Dugdale to commemorate the Museum's 25th anniversary.

NEW RULING ON DUPONT TROPHY ELIGIBILITY

Last minute news is that the controversy over eligibility for the prestigious du Pont Trophy has been settled. There is no limit to the number of du Pont Trophies (sponsored by the Delaware Museum of Natural History) an individual may win in his lifetime.

1996-1997 ADVERTISING RATES

Advertising in *AMERICAN CONCHOLOGIST* is presented as a service to our membership, but does not imply endorsement of the advertisers by *AMERICAN CONCHOLOGIST* staff or the Conchologists of America, Inc. Advertising space is available at the following rates: 1/2 Page: \$600 per year or \$165 per issue. 1/4 Page: \$300 per year or \$83 per issue. 1/8 Page: \$150 per year or \$50 per issue. Deadlines are as follows: #1: Jan. 15; #2: Apr. 1; #3: Jul. 1; #4: Oct. 1. Send advertising copy to the Editor, Lynn Scheu, 1222 Holsworth Lane, Louisville, KY 40222-6616. Send all payments and space reservations to the Advertising Manager Glen A. Deuel, 8011 Camille Drive SE, Huntsville, AL 35802-3113. Make checks payable to Conchologists of America. Also note that *American Conchologist* now accepts single sheets (8"x11") or 11" folio advertising inserts. Interested prospective advertisers may inquire for price and requirements by contacting the Editor's office, phone: 502-423-0469 (after 4:00 EST); email: AmConch@ix.netcom.com; or by U.S. mail: 1222 Holsworth Lane, Louisville KY 40222-6616.

MAP OF THE CAPE PENINSULA



MAP OF THE CAPE PENINSULA

For those Geographiles among us who dote on South African shells, Bruno de Bruin of Hout Bay, South Africa (see map) has created a close-up view of the Cape of Good Hope—False Bay area, adding in all those little places that appear on our data slips but that we can never find on maps. Expect another of these maps in June—showing the whole coastline of South Africa.

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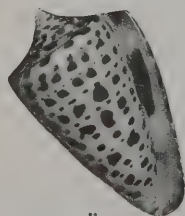


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WHY DO SHELLS HAVE THEIR COLORS?

by Gary Rosenberg, ANSP

As a curator of a large shell collection, I am often asked why shells have their colors. The most frequent form of the question is, "Are those the natural colors?" I resist saying "No, we painted all 12 million specimens in our spare time," and explain that the colors are indeed natural and are generally thought to serve as camouflage. This answer satisfies most people, but usually does not satisfy the experienced shell collector. What about color in deep-sea shells never exposed to sunlight or in species active only at night, or where the color is hidden by thick periostracum or inside the valves and can be seen only when the animal is dead? Clearly there is more than one explanation for color in mollusks.

In broadest terms, explanations can be categorized as visual or non-visual. In visual explanations, color serves either for camouflage or communication. If the species involved have only black and white vision, then degree of contrast, not color itself, is what is important. Non-visual explanations say that color is incidental — it is an epiphenomenon. The color doesn't have a function in itself, but is associated with some other function. Asking why some shells have their color is like asking why mammalian blood is red — that happens to be the color of the pigment hemoglobin when it is oxygenated.

Visual Explanations

In some cases, bright colors might serve to warn predators that a species is poisonous or distasteful, examples among mollusks being some nudibranchs and ovulids such as *Cyphoma*. Color is probably not used for communication within species in mollusks, except perhaps some cephalopods which have well-developed image-forming eyes. With mollusks, visual explanations of color usually invoke camouflage, which can be achieved in several ways:

- 1) Make pigments that match the background. Many excellent examples of camouflage are found among land snails, which often blend in with leaf litter. But camouflage occurs even in the deep sea. There's no sunlight, but some predators produce their own light. Thus pelagic deep sea fish are black, merging with the void, but bottom dwelling organisms in the deep sea tend to blend in with the bottom. (This might also involve not making pigment, if the substratum is white.)
- 2) Take pigments from something eaten. For example, simnias on sea whips take purple or yellow pigments from their hosts. A yellow simnia transplanted to a purple host will thereafter deposit purple shell.
- 3) Look different from conspecific neighbors. This would make it hard for predators to form a search image and might explain the enormous variation in species like *Donax variabilis* and *Umbonium vestiarium*. Both species burrow in sand at the edge of the intertidal zone where waves break, scattering them like pebbles, and in both, almost the full range of variation in the species can be collected in a few handfuls.
- 4) Use chromatophores to blend into the background. For example, the cuttlefish *Sepia*, which does not have color vision, tries to match the contrast pattern of the background. It can be misled in an aquarium by gravel of unusual colors.

Non-visual Explanations

- 1) Result of crystal structure. Nacre in abalones is a good example. The nacre is not seen when the animal is alive, and its color is incidental to its function.
- 2) Metabolic waste products stored in the shell. This explanation is often advanced, but there are no proven examples in mollusks. Why spend energy to get waste products into the mantle for deposition in the shell instead of just excreting



Umbonium vestiarium

them? And if it were essential to get rid of waste products in this way, then albino shells should die young of metabolic poisoning. Also, shell pigments that have been studied are the same types of pigments made by other groups of organisms.

- 3) Temperature regulation. In some intertidal species, a light colored shell might aid in preventing desiccation by keeping temperature lower. In subtidal species, ambient water temperature would minimize any temperature effect of shell color.
- 4) No predators so anything goes. First, few mollusk species lack predators. Analysis of stomach contents of batfish and lobsters has shown that they'll eat almost any mollusk they encounter. Naticids and octopus are also omnivorous — think how many species you've collected with drill holes in them. Look at the percentage of shells that have repaired breaks, which are often the result of failed attempts at predation. Second, if pigment has no function, it should just be lost, because it takes energy to produce: witness cave animals. Although molluscivory is widespread, many mollusk species have few predators that use vision to find their prey. So why do so many shells have pigmented color patterns, especially inside the shell or hidden by periostracum where it can't be seen?
- 5) Pigment strengthens the shell—it serves a structural function. Color patterns often align with spiral or axial sculpture. Sculpture, like corrugation in cardboard, strengthens shells against predators such as crabs, and pigment might further strengthen it. Instead of producing and transporting a thicker shell, it might be more energy efficient for mollusks to make pigments. Pigments might also impede propagation of a crack in the shell. The structural explanation also works for color inside of shells. A good example is *Mercenaria mercenaria* (the quahog or cherrystone clam). The purple inside the shell, hidden when the animal is alive, lies along the edges of the shell, just where the big *Busycon* whelks are likely to attack. The pigment in *Mercenaria* presumably makes it harder for *Busycon* to chip the shell. Under the structural explanation, albinos would be at a disadvantage, but it wouldn't be fatal to all individuals. And cave animals, which generally don't face predation (or big waves), wouldn't need pigment for structural reasons.

Mixing and matching

More than one explanation can apply to a species. Because each species has different biological characteristics, it has to be evaluated on its own merits. The explanation for one species might not apply to another. For example, *Busycon contrarium* (the

WHY DO SHELLS HAVE THEIR COLORS? (Continued from page 25)

Lightning Whelk) makes a color pattern when it is young, but stops making it as it gets older. Maybe it no longer needs camouflage against predators once it reaches a certain size (or maybe it changes habitat?). *Conus leopardus* (the Leopard Cone) has a thick periostracum which hides its color pattern. Large adults stop making the pattern — maybe the shell is thick enough after a certain size that it doesn't need to be reinforced. And *Mercenaria* doesn't make the purple color as a juvenile — maybe the juvenile shell is too thin to stop *Busycon* even if pigment is

built in, so the animal concentrates its energy on growing till it reaches a size where the pigment makes a difference. So far, all these explanations are merely just-so-stories. It's easy to concoct scenarios, but hard to test them. To start with, I'll need a vise and a set of matched albino and normal shells....

Thanks to Stanley Francis, Harry G. Lee, Russell Minton, G. T. Watters, and other subscribers to Conch-L whose ideas during online debate on Conch-L prompted me to write this column.

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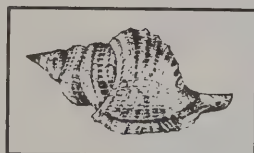
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Our conchological community has lost a unique and resourceful member. Betty Hunter died quietly on December 3. She was 71 years old and had been retired from her professional career for five years. "Retired" is a bit of a malaprop for her level of activity; you see she was an educator. The powerful instinct impelling those of her ilk does not always yield to the temptations of inertia which lurk in life's autumnal shadows.

Betty was a native of Northeast Florida and received her education here, attending Fletcher High School in Jacksonville Beach during the war years. She spent the rest of the 1940's as a student at the newly-ordained Florida State University (formerly the College for Women) in Tallahassee, from which she returned with a master's degree and an ambition to teach Classical Culture to secondary school students. Oh how she did that! At Nathan Forrest High School she taught two generations of students and saw many prosper academically and in their various careers. Many of these "critters" and her fellow teachers collaborated to recognize her achievements with kudos such as North Florida Star Teacher Award (1968, *et seq.*), Duval Teacher of the Year (1975-76), charter membership in the Duval Co. Teacher Hall of Fame, and Outstanding Secondary Educator of America (1975). On news of her death, Forrest High School's faculty and administration established a scholarship fund in her memory.

Betty's mother, Mary, was a conchologist, but Betty did not immediately manifest that bent. Shortly after Mary's death, her daughter began her adventure in conchology—perhaps by having inherited a combination of genetic predisposition and a fine small shell collection. What she did from that point is "wondrous." In a mere 13 years of collecting and study, Betty Hunter created a masterpiece. Driven by her pedagogical and intellectual

inclinations, Betty collected shells as instruments to invigorate the teaching of Classics. She was fascinated by the wealth of Roman and Greek culture embodied in the scientific names of mollusks. She developed copyrighted teaching programs such as *The Roman Army*—recreated with the names of various *Conus* species. Her study of molluscan nomenclature extended into topics such as mythology, anthropology, ancient history and geography.

At some point after the first few years of her involvement, shell collecting in itself became a bit more of a priority, but Betty was virtually always able to illuminate any of us with the etymology, symbolic relevance, and grammatical constitution of the name of her latest cowrie acquisition. The teaching of conchology and Classics continued uninterrupted after official retirement. Her students included youngsters from almost every elementary school in Jacksonville—particularly those of her parish school, St. Matthew's. Betty Hunter also reached a vast and appreciative audience in the "shell world." One needs only to recall her programs at local and national meetings, see her original and educational exhibits at a number of shell shows, or pick up a copy of the *Shell-O-Gram* or *American Conchologist* to take measure of her contributions.

Betty left a fine collection of about 5,000 lots to the Florida Museum of Natural History. Malacology Collections Manager Kurt Auffenberg told me the museum was unusually pleased with the donation. The fine and rare *Cypraea*, *Conus*, muricids, and paleotropical terrestrial snails nicely complement the museum's prior holdings.

Elizabeth Hunter was a consummate sheller. She hit the fossil pits, tidal flats, scallop dumps, auctions, shell shops, mail order catalogues, and shell shows. But most of all, she hit the books. In doing so, she ably led armies of her students (and almost all who knew her fit that definition) in her literacy crusade. We shellers have been elevated by her excellence and industry and are diminished by her passing.

—Harry G. Lee

Mario Angioy July 1920 - January 1996

On the morning of Monday, the 20th of January, Mario Angioy passed away. It was a peaceful death, in the arms of his wife Kety. The day before, Mario had celebrated his name day together with his son Paolo, his daughter-in-law Maria Antonietta and his grand-children Veronica and Volodja. Nothing announced his imminent departure, because, after a period of poor health, he seemed to have regained his interests in life and study.

Mario Angioy was born in Turin on the 20th of July, 1920, the only son of a Sardinian father and a Sicilian mother. As a young officer, he was a prisoner of war in the Soviet Union, alongside his father, General Paolo. A graduate in Political Sciences, he could speak half a dozen languages. After the war he had a successful administrative career which led him to become General

Director of the Italian Chamber of Deputies and Honorary Griffier of the European Parliament.

In 1948 he married Ekaterina Nicolaidou, a young Greek lady, who soon infected him with her great passion, malacology. Together, under the names of Angelo Mari and Kety Nicolay, they decided to start a magazine, *La Conchiglia*, or *The Shell*. The first issue appeared in 1969 and it remained the only publication of its kind in Italy for a long time.

Mario's last article, a set of considerations on malacological nomenclature, was found, unfinished, on his Macintosh. The magazine has therefore suspended the publication of issue 281 in order to include it as a last tribute to one of its founders. All those who loved and held him in high esteem will certainly appreciate it.

—Guglielmo Biraghi

SCALLOP DUMP MEMORIES

by Charlotte Lloyd

Scallops. The luxury seafood. So sweet, succulent and rich, who can resist them? Calicos were scarce until 1980, but then things changed. Large beds of calico scallops, *Argopecten gibbus* (Linné, 1758), were discovered off Florida's East Coast. News of the calico beds in Florida brought boats from North Carolina to Texas, and fishermen swarmed the Cape Canaveral docks. The heyday had begun. Not only was it a bonanza for fishermen, processors, retailers and seafood lovers, but shell collectors soon discovered the by-catch coming in with the scallops — SHELLS!

The Cape Canaveral processors were dumping the by-catch at several sites around the Cape. The word was out — shellers swarmed! Those lucky collectors who lived nearby could go any time they wanted; for those of us in Jacksonville it was just a 3 hour drive. What a grand time it was! Armed with buckets, rakes, plastic bags and coolers, we would make a day of it, digging, discovering, bending over odiferous mounds until our noses and our backs couldn't take any more. The bonanza lasted for several years.

Then one evening, My husband Vic came home from diving and said, "I dove a spot today, really thick with scallops in about 110' of water. I gave the LORAN reading to a friend who's scalloping, and he is going to check it out." It turned out to be a very large bed. Scallops had arrived offshore of Mayport! Soon we had a processing plant in St. Augustine, and scallops were being unloaded at local docks on both sides of the St. Johns River. I had the good fortune to work at a school in Mayport, just one half block from where they unloaded! It was a simple task to keep track of the boats when they left, figure when they would return with their harvests and be there to meet them. Why, it even became mundane. Did I want to go collect shells today?

Working the conveyor belt was great for shells an inch or larger. Standing on a box, I would look at the belt as it moved along bearing its assortment of scallops, along with fish, shrimp, crabs, starfish, sponges, horse conchs and the occasional barnacle-encrusted drink can. They were so used to me working the conveyor belt that I soon acquired the duty of "large sealife remover," the person in charge of keeping objects from jamming the belt. The feat was to try to find a cone, nutmeg, cowrie-helmet or other treasure and grab it before it traveled out of reach, while also grabbing large broken horse conchs and other bottom debris and flinging them in a box for the dump. And grab them I did; but all those buckets of shells carried home had to be cleaned. This meant boiling and microwaving the fresh shells. Sometimes I froze the larger ones. I had heard of a method, and soon discovered it worked quite well, especially when arriving home at midnight, tired, aching, dazed and splattered. I sealed all shells under 4 inches in gallon containers with one-half water, one-half pure pine oil; this way they could be stored until I was ready to deal with them. If I used this method, they would not smell when I opened the jar, and if I left them for several weeks, the pine oil would partially dissolve the animals, leaving the opercs in the bottom of the container. This method was even OK for glossy shells like *Oliva bollingi bifasciata* Clench, 1937. The pine oil protected the shells from the acid of the decaying flesh. Some jars sat in my garage for three years. It was a monumental task, trying to keep up with all the shells carried home. But they were destined for land fill — it seemed such a waste to leave them!



Gail Motes looks over the scallop haul on the boat.

Then there were the scallop dumps. This is where the by-catch ended up (usually somewhere out in the woods away from habitation). I'll try to describe it for those of you who have never shelled a scallop dump. Picture, if you will, a 12-foot high and 30-foot wide pile of empty scallop shells, with just about every kind of sea life from the ocean floor thrown in. It wasn't too bad collecting at the dumps in winter, but summer could be brutal. The heat combined with the ammonia fumes rising from the pile of decaying animals would cause your eyes to burn and water, and it was difficult to breathe. Flies were everywhere. Large shells such as *Cassia madagascariensis spinella* Clench, 1944, *Pleuroploca gigantea* (Kiener, 1840), *Muricanthus fulvescens* Sowerby, 1834, *Tonna galea* (Linné, 1758) and *Busycon sinistrum* Hollister, 1958 would be at the base of the piles, where they had rolled because of their weight. John Timmerman recalls of his one visit to a dump in North Carolina, "I thought the odor was bad when I first arrived; upon opening the pile with a rake, I had to position myself up-wind from the hole. After two hours of digging I finally had to call a break to get away from the stench. My wife Nancy has no sense of smell; she can only imagine why I wanted to get away from this pile of shells. I did gather up several dozen of the least battered examples of the most amazingly dark *Strombus alatus* I had ever seen, as well as *Fasciolaria*, *Busycon*, *Phalium* and *Distorsio*."

Dump wearing apparel was always important — you didn't want to wear anything good, because it was impossible to remove the smell from your clothing. I started wearing my white rubber fishing boots (for which I took ribbing), because I got tired of throwing away cloth tennis shoes; and besides, my feet felt more protected in the boots. Those broken shells, fish bones and assorted forms of sea life could be sharp. On one occasion our group (Jacksonville Shell Club members and friends) were at the dumps at St. Augustine; it was early summer and it was HOT! When we arrived that morning, we were greeted by a six foot wide, 3 inch deep undulating "sea of maggots" around the mountainous pile. Of course I put on my rubber boots and waded right through, while others tried to find ways to get across the maggot moat in their tennis shoes. I never heard any more about my boots, and later noticed that others had taken to wearing them. That particular day was a great one for finding large *Junonias*. Most of us had found several when my friend Billie Brown started lamenting that she couldn't find one. Norman Paschall, being the kind-hearted person that he is, sidled up to her and slipped a particularly choice specimen into her pants pocket. Billie later said, "I really appreciated Norm's thoughtfulness, but I wish he had shaken the maggots out of it first." Collecting at the scallop

dumps was definitely not for the faint-of-heart. However, it was something both the scientific collector and shell crafters could do together. There was great camaraderie, the collectors all trying to outdo each other with a terrific "find," while from the crafters we would hear, "Look at these shells! They'll make great duck feet!"

I think the best of times were the days spent at Ft. George Island where the scallop tailings had been used as landfill. We spent many a day sitting on the sand/shell mounds (old ones that were cured), and sifting through the sand looking for small shells. It was such an enjoyable way to spend the day, and productive too. For we were in the process of keeping a checklist of marine mollusks occurring offshore in our area, and the scallop tailings greatly added to it. It became a contest to see if you could find anything new for the list. Of course what couldn't be identified was promptly taken to Harry Lee for his inspection. Harry states, "Of the approximately 750 species of marine mollusks we have recorded from the continental shelf of NE Florida, more than half have come to our attention through the examination of the scallop fishery's by-catch. I estimate that nearly 100 species are known to our group SOLELY as a product of this ephemeral enterprise. A fair proportion of these 100 species are known from the dissection of the entrails of mollusk predators, especially two species of batfish, again taken as by-catch by the fleet." Harry was a dedicated batfish dissector. I tried it several times and soon decided I would rather sort through sand than batfish guts.

Before the days of scallop boats, my collection consisted of shells that I have found while SCUBA diving. Our reefs off Mayport are fairly deep, 80-140', which limits bottom time, so my collection was definitely lacking some of the small, rarer shells. The scallop boat tailings helped fill that void. I was able to add specimens like *Niso hendersoni* Bartsch, 1953; *Cirsotrema dalli* Rehder, 1945; *Olssonella smithii* (Dall, 1888); *Trigonostoma tenerum* (Philippi, 1848); *Distorsio constricta mcgintyi* Emerson and Puffer, 1953; *Callista eucymata* (Dall, 1890) and color variations of *Spathochlamys benedicti* (Verrill and Bush, 1897), plus micros that I will never find diving.

Jim and Linda Brunner of Panama City, on the west coast of Florida, also were fortunate to have had access to the scalloping process in their area. They too helped cull the catch while the boats unloaded. Linda states, "The best thing to come from the scalloping was all the new species that we were able to add to our area species list, and the information gained about the scalloping process. We were able to establish several range extensions when we reviewed the literature available."



Charlotte surveys the vast piles of scallop shells.

A friend, who owns a 65' shrimp boat, started scalloping in the off-season when shrimping was poor. He invited me and my sister-in-law, Gail Motes, to make a trip with him so we could see first hand what it was like to go scalloping. My husband's parting words to us were, "Stay alert! You know these scallop boats capsize all the time." Yes, I did know that, but preferred not to think about it. The fact remains, when shrimp boats are used for scalloping, an activity for which they are not designed, problems can arise. Shrimp boats are designed for the catch to go into the hold below deck; the catch then acts as ballast to help steady the vessel. When scallops are piled on top of the deck, the added weight makes these boats very top-heavy.

Once we arrived at the scallop grounds the wind picked up to 15 knots, and we had about a 10' ground swell. Just our luck. Every time a particularly large wave hit, we held our breath — was this the one that would send us over?

The scallops were plentiful, and they dragged their nets only 20 minutes for each haul before bringing them aboard. Any longer and the winches and cables wouldn't have been able to lift the thousands of pounds onto deck. Scalloping is extremely dangerous work. The two crew members had to crawl over the top of the slippery scallops piled up to the gunwales, trying not to lose their footing, while working the winch and emptying the nets. If one of them slipped and fell overboard, finding him would be very hard, for it was night and the seas rough. With all this going on, we just stayed out of the way of the workers. The only shells that I collected on this trip were a beautiful black olive, *Oliva pattersoni* Clench, 1945, and several *Lyropecten nodosus* (Linné, 1758).

(Continued on page 31)



Scallop crew at work.

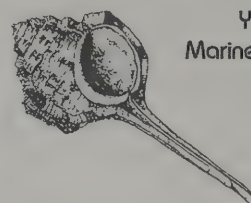
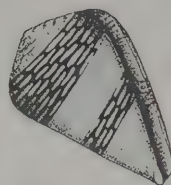


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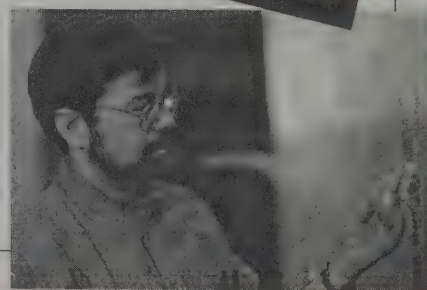
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SCALLOP DUMP MEMORIES *(Continued from page 29)*

Several factors have contributed to the decline in scalloping: Overharvesting by fishermen in an industry that was not then regulated. Wasted juvenile scallops. Invasion of nematode parasites in the scallop muscle (which continues today). Environmental concerns about dumping the heated discharge water from processing plants into local waterways, which endangers wetlands. Waste disposal and dumping scallop byproducts in landfills. (Laws in most areas now make it necessary to cover the by-catch with sand within several hours.) There for a while it looked like the industry was trying to kill itself. Then the South Atlantic Fisheries Management Council, the Florida Department of Agriculture, and the FDA stepped in to find a solution for these problems.

Scalloping still continues on a smaller scale, on both the east and west coasts of Florida. It is virtually impossible to gain permission to be admitted to any scallop facility nowadays. Liability insurance coverage is usually the reason given for not allowing access to shellers. I'm sure reports of plant owners being sued had something to do with that situation. I know at Fort George a collector talked a dock owner into letting her stand by a conveyer belt to collect, she fell, broke an arm, and then sued the owner. Incidents like this stopped the activity for all of us. Most of us have heard about the sheller buried by scallops when he wouldn't get out of the way of the dump truck at the scallop dumps at Cape Canaveral.



Harry G. Lee, George Hapsis, Jack Gebert and Babe Schneider use screen boxes to sift sand from scallop tailings.

It sure was fun while it lasted. I think about all of the times I could have collected and didn't. Reminds me of a 1969 Mary Hopkin song, "Those were the days, my friend, we thought they'd never end!"

See back cover for "Scallops Dump Treasures."

GAMBLING CASINOS — THREATS TO FOSSILS AND MUSSELS?

Floating gambling casinos are springing up around the U.S. The promise of huge profits mean huge investments. Trouble is, the sites chosen for these floating gaming palaces to be located are often ecologically unsound. In Mississippi, the Big Black River fossil locality, featuring 30,000,000 year old Lower Oligocene Byram Formation fossil mollusks and coral, as well as remains of Oligocene land mammals, was threatened by such a site. Fears were that tourists attracted by the gambling casino would trample or remove the fossils. But by a close vote, influenced by letters from scientists and others around the world, the Mississippi casino was rejected and the fossil site saved.

At the same time, a casino has been planned for an Indiana casino downriver from Louisville, Kentucky. Opposition from ecological concerns has been great, some of it from the state of Kentucky, which reaps a great deal of income from gambling itself, in the form of race track betting. COA member Doug Shelton of Mobile Alabama, who is an ecological consultant, has been doing some of the fact-finding on the site which has turned up possible evidence of endangered mussels there. However, it seems that more vocal and organized opposition from other nature-oriented organizations may turn the tide against the casino, planned for a quiet area of the Ohio river adjacent to the mouth of a feeder stream. But at this writing, the area is still in danger.

IT'S JAMBOREE TIME AGAIN!

Do you sometimes think you'll never last til the COA Convention in July? Satisfy your craving for shell talk and visit with old shelling friends at the 1997 Suncoast Conchologists' Shellers' Jamboree. Memorial Day weekend (May 24-26) will see shellers from all around Florida and nearby states flocking to the MinnReg Building in Largo, Florida for a full weekend of fun and food. Crafts, silent auction, raffle, auction, prizes, and a parade of snails all await the impatient among us. Interested? Contact Joan Pearson at 11710 Parkview Lane, Seminole, FL 33772-2207. No dealer sales allowed!

Texas, being the biggest state down here below the permafrost, has its own version of a Shell Jamboree, the Texas Connection. All the same kind of stuff goes on, but with a Texas flair, and for Texas shellers. Hosted by San Antonio Shell Club in its debut year, 1996, this year's Texas Connection will be in Lake Jackson, Texas, the first weekend in May, and will be hosted by the Sea Shell Searchers of Brazoria County.

The Walter Sage Memorial Fund was established in 1995 in memory of longtime COA member and Treasurer, Walter E. Sage III. The first Walter Sage Grant was awarded last July to Ross Gunderson and Russell Minton of the University of Wisconsin-Parkside for their work on molluscan color patterns. Another grant will be awarded in July 1997. Your contributions to this endowed fund are fully tax deductible. Make your check payable to The Academy of Natural Sciences of Philadelphia, and send it, along with a cover letter of explanation to Dr. Gary Rosenberg, Department of Invertebrates, Academy of Natural Sciences, 1900 Benjamin Franklin Parkway, Philadelphia PA 19103-1195. The current amount in the fund is \$8,920.33.



Callista eucymata, a treasured bivalve find from the scallop dumps.

SCALLOP DUMP TREASURES

Lyropecten nodosus, up close and personal.



Argopecten gibbus in colors few of us dream exist. The center measures 92mm, still the world record?



Spathochlamys benedicti in an enviable array of colors, a perk of any scallop dump sheller.



AMERICAN CONCHOLOGIST

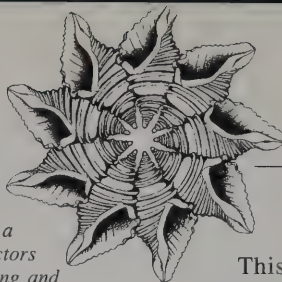
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CONCHOLOGISTS



OF AMERICA, INC.

VOL. 25, NO. 2, JUNE 1997

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors - the beauty of shells, their scientific aspects and the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a resolution concerning the conservation of mollusks: *Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.*

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MEMBERSHIP

Memberships are for the calendar year, January-December, late memberships retroactive to January. **1997 DUES:** (USA, Canada, Mexico) \$20.00; Postal surcharge: \$10.00 for other Western Hemisphere nations; \$12.00 for Europe; \$15.00 for Asia, Africa and the Pacific Rim. Please pay in U.S. dollars, or on check with Transit Enrouting and Account Numbers printed at the bottom, or with money order; make checks payable to CONCHOLOGISTS OF AMERICA. **NEW MEMBERS** apply to Lucille Green, **MEMBERSHIP DIRECTOR**. **RENEWALS** go to **TREASURER**, Bobbie Houchin. **BACK ISSUES** are available from **PROPERTIES DIRECTOR** Hank Foglino, 4 Trent Court, Smithtown, NY 11787-1266. Prior to 1985 \$3.00 each; 1985 to current \$5.00 each.

PRESIDENT'S MESSAGE

This year, COA's Annual Meeting will be a SPECIAL meeting. I plan to look back at our first 25 years by honoring all the past Presidents and presenting some other special awards and acknowledgments. The results of last year's survey will be announced and the name of the winning participant will be drawn. Please try to attend this year's Business Meeting and, before you come, take a moment to reflect on the memories of past conventions you have attended.

In April, the big question being asked in COA was "Where is my *American Conchologist*?" I know this caused many problems for members planning their trip to the 25th Silver Anniversary Convention. We apologize for any inconvenience this may have caused. Editor Lynn Scheu mailed the March issue of the *American Conchologist* on March 20. Although Lynn sorts and packages the mail for distribution, it is the United States Postal Service which takes these packages and delivers them to our members. Once the publication leaves Lynn's hands, COA has no control over the delivery process. I want to assure you that Lynn Scheu and COA have done everything possible to expedite delivery of your *American Conchologist*. It is unfortunate this happened, especially since the convention registration forms were enclosed with this issue. (For those online, the registration forms were on CONCH-NET.)

One of the main topics I will discuss with the COA Board in Captiva is, "How does COA prevent this from happening again?" The Board will be looking at several options. I will discuss this topic at COA's Annual Business Meeting. In the future, if you have any membership questions, please contact Lucille Green, Membership Director.

I am pleased to announce "DISCOVER THE MAGIC: COA '98" hosted by the Central Florida Shell Club, Orlando, Florida. Linda Koestel, COA President 1994-1996, will serve as convention chairman. The convention will be held July 19-23, 1998, at the Royal Plaza Hotel in Walt Disney World Village. That is correct, in keeping with many of the Walt Disney World themes, you will have the opportunity to see the two most popular mice in the entire world, MICKEY and MINNIE. This will be a super opportunity for members and their families to attend the COA Convention AND enjoy Walt Disney World and the other outstanding attractions in the Orlando and Central Florida area.

I look forward to seeing each of you in July at the South Seas Plantation on beautiful Captiva Island. Anne Joffe and all the members of the Sanibel-Captiva Shell Club are really working hard to make this 25th Silver Anniversary Convention one to remember. I hope you will come and be a participant in that celebration. See you in July.

Best Wishes,
DAVE

In Memoriam

MARY (DIDI) FLEISCHNER

JACOB J. GETTLEMAN

FRONT COVER: A birdseye aerial view of the island of Pura in the Alor Archipelago photographed by Mike Severns, is representative of the many islands in eastern Indonesia where isolation has provided an environment where extreme variations of *Amphidromus* can evolve. From left to right are: *Amphidromus inconstans gracilis*; *A. i. inconstans*; and *A. wetaranus*. Shells photographed and graphic composited by Richard Goldberg.

THE COA SILVER EDITION APPROACHING

by Anne Joffe, COA Convention Chair

The COA 25th Anniversary Meeting will be held July 13-18 at South Seas Plantation on Captiva Island. There is still time to decide to attend, and if you need any last minute information, contact me.

One of the highlights of this meeting will be an Open House at the Bailey-Matthews Shell Museum where you will be greeted by Dr. Jose Leal and be allowed the opportunity to see behind the scenes of a museum. You may tour the Collections area, see the fabulous library of shell literature, or just view the exhibits and learn some new things. This will happen on Monday between 10:30 a.m. and 2 p.m. Of course you are welcome to go to the Museum at any time during the week, but the Museum is closed on Mondays so the Monday Open House presents a better opportunity to see it.

Another high point will be the programs. We have scheduled a very diversified group of speakers, some of whom you have never before had the pleasure of hearing at a COA meeting. Have you ever wondered how to tell the ages of shells? Have you thought about shelling in Labrador, or even wondered if there would be shells there? You'll be very surprised to learn the answers. Another interesting talk will be

about raising scallops, a hobby that perhaps might interest you. The programs begin Sunday afternoon at 1:00 p.m.

Field trips are also interesting and should appeal to all. The mud flats shallow water collecting trips allow you to see not only our marine shells, but also the complex flora and fauna of the flats, including the best bird watching areas. It is more than just shell collecting. All types of sea and shore birds inhabit our mud flats, as well as raccoons, otters and an occasional reptile or two.

For those who dive, this will be a highlight of other dive sites. Though Sanibel-Captiva is not usually thought of as a great diving area, I think you'll find an abundance of life in our waters, including the unusual along with the expected.

If you enjoy the past, a bit of history, the Shell Mounds of the Calusa Indians is absolutely fascinating. These sites, owned by the State, are restricted to visitors on guided tours, so this is a rare opportunity to see these historic sites.

All of you who will be joining us to celebrate COA's past 25 years are in for a fabulous time. If you are unable to attend, we'll miss you! And you'll really be missing out on a terrific occasion.

Anne can be reached at 941/472-3151. Or fax her at 941/472-3153.

ISOLATION AND EVOLUTION OF THE *AMPHIDROMUS* IN NUSA TENGGARA

by Richard L. Goldberg & Mike Severns

The eminent malacologist and land snail aficionado William Clench once claimed that if he were transported blindfolded to a tropical Pacific island, he could determine his location based on the color forms of land snails that he would encounter. If, as Clench proclaimed, an island's unique land snails can act as indicators of geographical location, then, ostensibly, a snail sleuth familiar with variations of insular species could also ably track his way through any tropical archipelago of the world.

Variable color and pattern are a hallmark of many tropical land mollusks. Yet this variability has caused countless wrong turns on the road map of taxonomy. The **polymorphic** nature of these snails confounded early taxonomists who often described many color forms as new, without any consideration of their relationship to adjacent **populations**.

Studying landshell variation can be a fascinating pursuit for any shell collector. When laid out in collection drawers, a well organized and documented series of landshells can provide a conchologist with the opportunity to observe an evolutionary moment in time of a species. The varied and aesthetically pleasing series of snail shells can also reveal information from which to learn more about the similarities and differences among neighboring species.

A land snail species can develop a shell with myriad color forms within one population (**intra-population variability**), or may vary from the **norm** only in isolated populations within its range (inter-population variability). Occasionally a species can exhibit both phenomena. A number of biological concepts may be useful in explaining why a species of snail can vary locally or over its entire range.

The external appearance of a shell — color and pattern, for instance — are likely to be influenced by **natural selection** when determining the genetic make up of a snail. Extreme color polymorphism in a population perhaps indicates that looking different from your neighbor is advantageous, making it more difficult for predators to develop a search image, such as color and contrast, to locate their prey. The unique color form can then spread rapidly in a population. This phenomenon, known as **frequency dependent selection**, may explain why some intra-populations of

snails in the genus *Amphidromus* from eastern Indonesia often have unpatterned or strikingly different colored shells mixed in among the predominantly multi-colored or strongly patterned shells. Natural selection is typically considered to favor one form over another, thereby shifting the bell curve, yet frequency dependent selection flattens that bell curve and spreads it out.

One explanation for inter-population variability may be a phenomenon called **genetic drift**. To illustrate this, let's say a population gets split in two, one on island A, and one on island B. Both populations might start off identical, with chances at 50/50 for a particular trait. It is unlikely that the offspring will be 50/50. They may be 47/53, and the subsequent generation may be 43/57. Over many generations, the percentages will fluctuate up and down at random, and they can end up being very different from where they started. Yet, in the real world, a new mutation doesn't start at 50/50. It might be only 1/10,000 or 1/100,000. By chance it can have more surviving offspring than average, and slowly increase in the population. Smaller populations will drift faster than large populations. But, if by chance that first mutant does not have any surviving offspring, that trait disappears. This is a more likely scenario. So, genetic drift tends to eliminate variation within a population and increases differences between populations. Over a period of time, the populations from islands A and B will end up looking very different.

Inter-population variability might also be explained by the **founder effect**. The snails that colonize an island may represent only a small fraction of the parent population's genetic diversity. If a rare mutant color form is mixed in among the new colony, a colony that was 1 in 1000 in the parent population, it may instantly be 1 in 10 in the new population. Given a brand new set of environmental influences, the population may evolve in whole new directions from its parent population.

Environmental factors such as the geology, climate, flora, fauna, and food are all suspected contributors to the rise of a unique shell

See glossary p.7

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ISOLATION AND EVOLUTION (Continued from page 3)



appearance. To reduce the competition with other species which overlap in some aspect of their niches, a phenomenon called **character displacement** occurs. Shell, behavioral, anatomical or biochemical characters eventually deviate from the ancestral form to allow the species to survive with its neighbors. Character displacement might also manifest itself in the color, pattern, and even the form of the shell. Changes brought on by one, or a combination of, these biological concepts can eventually render an isolated population unable to interbreed with the parent population, producing a situation which makes speciation possible.

Isolation is the key ingredient for a species to evolve, and natural barriers provide the necessary separation to allow speciation to take place. Whether the barrier is a series of mountain ridges separated by deep valleys, as in the case of the Hawaiian *Achatinella* tree snails, or islands separated by wide channels as in the case of some species of Indonesian *Amphidromus*, isolation allows a species to evolve independently from its ancestral form.

An excellent illustration of how isolation influences independent evolution is seen in the species *Amphidromus inconstans* Fulton, 1898, which inhabits a limited group of islands in Nusa Tenggara, eastern Indonesia. Nusa Tenggara has served as a natural laboratory of evolution for *Amphidromus* and other biota, because of the region's long isolation from the surrounding Indonesian islands, and from Australia. Many **endemic** species are found here, including the exotic Komodo dragons.

Amphidromus inconstans has also caused a great deal of taxonomic confusion due to the complexity of the inter-relationship among neighboring species. *A. inconstans*, as it is traditionally understood and revised by Laidlaw & Solem in 1961, exhibits a broadly differing array of colors, patterns and, at times, shell form, throughout its range. A perfunctory examination of these color forms is deceiving, and gives a false impression of one widely ranging species. Recent field collecting throughout the range of *A. inconstans* has provided a much clearer picture of this intriguing group of snails. Initial observations of the comprehensive series of shells from this field work, and comparisons with neighboring species has shown that *A. inconstans* has a much narrower range than originally thought.

Taxonomically, *Amphidromus inconstans* is placed in the subgenus *Syndromus*, a group of sinistral species noted for their brightly colored and variably patterned shells (see *Am. Conch* 21(1): 5, "Variation in the *Amphidromus*"). Older collections with limited habitat documentation made it difficult to comprehend the full extent of the variability of *A. inconstans*, and its associations with species from adjacent islands. Also, early collectors often sorted out various color forms for aesthetic reasons, giving a false impression of inter and intra-population variability.

For instance, many species of *Syndromus* contain a solid yellow intra-population color form. These yellow shells were often separated



Map of Alor Archipelago by Peter Loud.

by field collectors because of their desirability. Since the shells had limited habitat data, by the time they reached museum collections, they were assumed to have come from different localities. It is now known that, in most cases, intra-population variability is commonplace in this group. Even with this in mind, *A. inconstans* poses a dilemma for taxonomists since there is strong evidence to indicate that we are dealing with more than one species.

Determining whether the color forms traditionally thought of as *A. inconstans* actually represent more than one species requires an understanding of Laidlaw & Solem's view of its distribution. As currently understood, the string of islands north of Timor between eastern Flores and Romang are home to the *Amphidromus inconstans* complex, a seemingly whimsical group that displays an enormous range of color and pattern. Each island in the geographical range of *A. inconstans*, starting in the west on Pantar and moving east to Romang, has populations that take on a unique appearance. Yet a traceable pattern to the whimsical nature of these extreme variations exists, and clearly offers visible evidence that populations of *A. inconstans* in the eastern and western portions of the range have evolved from different ancestral species.

The palette of colors and patterns exhibited by these snails becomes a **paradigm** for the evolutionary changes that are influenced by isolation. In this case, sea water provides a formidable barrier for isolating these insular snails. The bright, but mostly unicolored forms on the islands in the western part of its range are in stark contrast to the extremely intricate patterns of the eastern island forms.

Basically, the western islands of Pantar and Pura are home to the solid yellow color form described as *A. gracilis* von Martens, 1899 (Fig. 1 - 2). On the small island of Pura, the species begins to exhibit faint banding around the periphery of the body whorl (Fig. 4 - center).

Moving east to Alor, three distinct *A. inconstans* forms are found. The solid yellow *A. i. gracilis* form previously seen on Pantar and Pura lives side-by-side with an intricately patterned form considered typical *A. inconstans* (Fig. 3). This **nominate** form typically has four spiral brown bands on the body whorl, the upper two broken into

(Continued on page 6)

Photo Credits: (MS) = Mike Severns; (RG) = Richard Goldberg. Green background = volcanic islands, blue background = limestone islands. Figure 1: *Amphidromus inconstans gracilis* in situ on Alor Island (MS). Fig. 2: *Amphidromus inconstans gracilis* von Martens, 1899; Pantar Island, 38-39mm (RG). Fig. 3: *A. inconstans* Fulton, 1898; Alor Island, 34-37mm (RG). Fig. 4: *A. inconstans*, intermediate forms; Alor Island (left & right), Pura Island (center) (RG). Fig. 5: *A. oscitans* von Martens, 1899; Alor Island, 25-33mm (MS). Fig. 6: *A. oscitans*, Atauro Island, 25-26mm (MS). Fig. 7: *Amphidromus* sp.; Atauro Island, 35 - 39mm (RG). Fig. 8: *A. wetaranus* Haas, 1912; Wetar Island, 32-35mm (RG). Fig. 9: *A. wetaranus*; Pulau Reong Island, off north Wetar, 25-27mm; note differences with Wetar population (RG). Fig. 10: *A. rollei* Laidlaw & Solem, 1961; Nyata Island, off Romang Island, 31-35mm (MS). Fig. 11: *A. rollei*; two lots in the Delaware Museum of Natural History; (left) *A. i. subporcellana* Rolle, 1903, Roma Island (= Romang), DMNH # 147619, 30mm; (right) *A. inconstans*; Roma Island, DMNH #147125, 33mm (RG). Fig. 12: *A. contrarius* (Mueller, 1774) form: *nikinensis* Rensch, 1931; Timor, 33-36mm (RG). Fig. 13: *A. contrarius*; Timor, 39-41mm (RG). Fig. 14: *A. poecilochrous* Fulton, 1896; Flores Island, 25mm (RG). Fig. 15: Protoconchs with and without black dot (left to right) - *A. inconstans*, Alor, without; *A. oscitans*, Alor, with; *A. sp.*, Atauro, protoconch darkened; *A. wetaranus*, Pulau Reong, with; *A. wetaranus*, Wetar, with; *A. contrarius*, Timor, with (RG).

ISOLATION AND EVOLUTION (Continued from page 5)

irregular brown squares. It has a base color of yellow and white. This pattern varies considerably and, in a series, shows a remarkable gradation into the unicolored *gracilis* form (Fig. 4 - left & right).

Also on Alor, a thin shelled form, *Amphidromus i. oscitans* von Martens, 1899 (Fig. 5), with its wavy radial streaks and more convex outline, lives at higher elevations. A solid yellow form of *A. i. oscitans*, in the past also referred to as *A. i. gracilis*, can also be found (Fig. 5 - right). The appearance of this distinct form on Alor, isolated from the lower elevation *A. inconstans* and *A. i. gracilis* forms, is one piece of evidence that *A. i. oscitans* may in fact be a distinct species. Early accounts report finding it only on Pura and Alor. Recently a few specimens were also found at higher elevations on Atauro (Fig. 6), the next island in the chain.

Atauro (also sp. Aturo) is a small island in the wide, deep channel between Alor and Wetar, just north of Timor. It possesses one of the truly beautiful and unique *Amphidromus*. This population exhibits a highly developed color pattern not seen anywhere else in the range of *A. inconstans*. Its white base color, with a dark blue/black to pale sky blue pattern overlaid with bands or flushes of yellow, provides a bridge to the more intensely colored eastern island forms (Fig. 7). Unlike the *A. inconstans* color forms from other islands, which tend to exhibit intra-population variability, the Atauro population is amazingly consistent in form throughout the island. This form has never been recorded in literature, and is presented here for the first time.

Continuing northeast to Wetar and the surrounding islets, one finds *A. i. wetaranus* Haas, 1912, a form which represents the greatest **divergence** from the previous forms (Figures 8 - 9). Until recently, only a few specimens of *A. i. wetaranus* were available for study. Haas originally described the shell as a full species. Later, Laidlaw and Solem (1961) reclassified it as a subspecies of *A. inconstans* based on its similarity to the Romang Island form named *A. i. subporcellanus* discussed below. There is a strong argument for removing *A. i. wetaranus* from the shadow of *A. inconstans* because of the consistently different shell, generally smaller size, more slender profile, and a unique and intense color pattern. It also exhibits red bands not seen in any of the *A. inconstans* color forms from the islands west of Wetar. The Wetar snails, like the low elevation Atauro snails, more closely resemble some forms of *A. contrarius* (Mueller, 1774) endemic to Timor and its western satellite islands (Figure 12). Much like the forms found on Alor and Romang, *A. i. wetaranus* also exhibits a great deal of intra-population variability.

Due east of Wetar is the termination point in the traditional range of the *A. inconstans* complex, Romang Island (Roma in older literature) and its satellite islets. Romang is home to an extraordinarily varied population of snails (Figs. 10 - 11). It is currently known as *A. inconstans rollei* Laidlaw & Solem, 1961; Rolle described the population as *A. i. gracilis* Rolle, 1903, but that name was **preoccupied** by the unicolored westerly forms from Pantar, Pura and Alor. In that same paper, Rolle also described three distinct color forms of his extremely variable *A. gracilis* (= *rollei*). Shells with narrow radial bands broken into spots by spiral bands of ground color were given the form name *A. subporcellanus*; *A. viridistriata* are those shells with a green band above the red columellar color patch; and *A. subsimplex* are those unicolored shells with only a red columellar color patch. These varieties of *A. inconstans rollei* intergrade so completely that the names have no real taxonomic value except as a means for collectors to single out a color form.

The geology of these islands plays a significant role in understanding why the western and eastern forms of *A. inconstans* probably represent distinct and separate species (see map). The islands west of Wetar, namely Alor, Pura, and Pantar, sometimes referred to as the Alor Archipelago, are geologically part of a string of volcanic islands that extend west through Flores, Indonesia and belong to the Asian continent. These islands are covered with lush green rain forests. The islands are very close together, allowing some genetic communication among snail populations. East of Alor, the islands of Atauro, Wetar, Reong, Nyata, and Romang are all part of the Australian Plate (Timor and Kissar are also grouped here, but

are not inhabited by *A. inconstans*). These uplifted limestone islands are covered with dry-land forest and, in some cases, eucalyptus.

It is significant to note that the forms on these limestone islands of the Australian plate, long considered to be related to *A. inconstans*, almost always have a black dot protoconch, a characteristic that is exhibited by *A. contrarius* on Timor (Figure 15). But to the west, on the volcanic islands of the Alor Archipelago, the forms of *A. inconstans* lack the black dot protoconch; instead, they have either light or white embryonic whorls. The only exception to this on the western islands is the high elevation *A. i. oscitans* of Pura and Alor, which does exhibit the black dot protoconch of the eastern populations.

This apparent evidence suggests that migration has occurred west to east on the volcanic islands, and southwest to northeast on the limestone islands beginning with western Timor and including the islands north and east of Timor. The genus *Amphidromus* may have originated in Asia and spread south and east into Indonesia. As the genus reached the small islands of eastern Nusa Tenggara, populations may have become more isolated than they were previously in their range and the distances between habitable islands may have increased. Those that made the leap between islands may have exploded into new forms and species with spectacular colors. It was those colors that immediately attracted naturalists to study these brightly colored snails, brought back to Europe aboard the ships of spice traders after they hopped among islands while sailing through eastern Indonesia.

Low sea levels, in some cases low enough to provide a land bridge from Singapore to Bali, provided *Amphidromus* populations the opportunity to move eastward. To the east in Nusa Tenggara, migration was most probably by storms, birds such as eagles, or even fruit bats which may have carried young snails between their feeding grounds and their nesting islands. The result is random dispersal over long distances. Populations became established on remote islands, leading to evolutionary isolation and independence from the ancestral form. With little or no genetic communication with the parent population, these isolated, island-bound snail populations could diverge to form new species.

A. i. wetaranus and *A. i. rollei*, which inhabit the eastern limestone islands, show a remarkable likeness to *A. contrarius* from Timor and its adjacent islands to the west. The general shell shape, black dot protoconch, and similarities in color/pattern of *A. wetaranus* mimic that of *A. contrarius* populations from the Niki Niki area of Timor, due south and west of Wetar Island. The shells of *A. wetaranus* tend to be slightly less inflated than *A. contrarius*, but other features are very close. These apparent similarities lead us to believe that *A. contrarius*, and not *A. inconstans* as has been believed, was introduced to Atauro, Wetar and from there to Romang where isolation and evolution have taken hold.

Other Timor populations of *A. contrarius* (Figure 13) also show a close affinity in shape, size, and dark protoconch to the low level population of *Amphidromus* from Atauro, in close proximity to Timor and of similar geological makeup. Yet the Atauro snails somewhat mimic the shell patterns of typical *A. inconstans* from Alor. This **anomaly** begs the question of hybridization.

A. i. oscitans from Pura, Alor, and Atauro presents another anomaly. The black dot protoconch and general shell characteristics exhibited by this species link it to *A. contrarius*, *A. wetaranus*, and *A. rollei*, yet isolation has allowed the snail to develop enough distinct shell characters to warrant specific status. Its habitat at higher elevations, removed from limestone, may be the reason for its having a thin shell, a trait often seen in species of snails living at high elevations.

This convincing evidence suggests that *A. inconstans*, long thought to be one highly variable species, has, in fact, succumbed to the changes influenced by isolation. The complex has seemingly evolved into four or five distinct species stemming from two ancestral forms; *A. contrarius* from Timor being the parent population for the *Amphidromus* inhabiting the limestone islands; and *A. poecilochrous* (Figure 14) from Flores & Sumbawa Islands possibly being the parent population for the *Amphidromus* on the

volcanic islands. Yet additional field work is necessary to confirm or deny our speculation that there is a connection between *A. poecilochrous* and *A. inconstans*.

If there is a pattern to this hypothesis, then the first species, *Amphidromus inconstans*, would include the color forms that inhabit the volcanic islands of Pantar, Pura, Alor (Figures 2 - 4); a second species, *A. oscitans* found only at higher elevations on Pura, Alor and Atauro would also be distinct (Figures 5 - 6); the limestone islands of Wetar and Romang would be home to the third and fourth species, *A. wetaranus* (Figures 8 - 9) and *A. rollei* (Figure 10) respectively; and finally the low elevation *Amphidromus* from Atauro may, in fact, represent another new species (Figure 7). A paper currently being drafted will delineate the Atauro snail.

Equipped with this empirical data, not only would William Clench have been assured of which island he had landed and collected on, but also this data would have clarified for him what direction he was heading if he had journeyed in the path of the spice traders through the islands in eastern Nusa Tenggara. This fascinating complex of *Amphidromus* is just one of many in the genus that offers a challenging puzzle for students of landshells, professional and amateur alike.

ABOUT THE AUTHORS:

Richard L. Goldberg is a mail order shell dealer with a strong interest in terrestrial, as well as marine shells. He has authored many popular articles on land shells. His photographs of living exotic snails have appeared in books and magazines, and his slide presentations on conchology are familiar to many shell clubs around the country. He is a Past President of COA, Past Editor of the COA Bulletin (currently American Conchologist), and Past Publications Chair of COA. Rich's professional background is as a television writer/producer/director (he produced the first one hour television magazine-format video dealing with conchology.) His recent introduction to Indonesia has convinced him to spend more time researching the variability of *Amphidromus*.

Mike Severns is a professional underwater photographer, and owner of a dive operation in Maui, Hawaii. Severns' pictures have appeared in many international magazines, and publications along with two books of his underwater photography. He is also a biologist with a particular fascination for land mollusks. Over the past 16 years Severns has made the first comprehensive study of the distribution, taxonomy, and morphology of the arboreal genus *Partulina* in the rugged West Maui mountains of Hawaii (see *Islands* magazine, February 1997, "Maui on the Wild Side".) During his field research on Maui, he has uncovered the bones of 36 extinct flightless birds, one of which is named after him. For the past several years has been exploring little known islands in Indonesia in search of unusual or rare forms of *Amphidromus*.

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GLOSSARY

Anomaly: Deviation or departure from normal order; peculiar, irregular, abnormal, or difficult to classify.

Biota: The combined flora and fauna of a region.

Competition: The simultaneous demand by two or more organisms for limited environmental resources, such as nutrients, living space, or light.

Divergence: In biology, the evolutionary tendency or process by which animals or plants that are descended from a common ancestor evolve into different forms when living under different conditions.

Endemic: Native to or confined to a certain region.

Genetic Drift: Random fluctuations in the frequency of the appearance of a gene in a small, isolated population, presumably owing to chance rather than natural selection.

Intra-population variability: Variation of a species within one population or one habitat.

Inter-population variability: Variation of a species in distinct populations throughout its geographical range.

Natural Selection: The process in nature by which, according to Darwin's theory of evolution, only the organisms best adapted to their environment tend to survive and transmit their genetic characters in increasing numbers to succeeding generations while those less adapted tend to be eliminated.

Niche: a. The function or position of an organism or a population within an ecological community. b. The particular area within a habitat occupied by an organism.

Nominate: adj. Pertaining to the subspecies that has the same name as the species — in this case, *Amphidromus inconstans inconstans*.

Norm: A standard, model, or pattern regarded as typical.

Paradigm: An example that serves as pattern or model.

Population: Related to ecology, all the organisms that constitute a specific group or occur in a specified habitat.

Polymorphic: Having different forms among the organisms of a single species, independent of sexual variations.

Preoccupied: Already used and therefore unavailable for further use. Used of taxonomic names.

Sympatric: Occupying the same or overlapping geographic areas without interbreeding. Used of populations of closely related species.

Whimsical: Erratic in behavior or degree of unpredictability.

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A LETTER FROM AUSTRALIA

Dear COA Members,

Are any of you planning to travel to Australia? Make it April 1998! The 2nd Australian National Shell Show will be held on 11-12 April 1998 in Sydney. International visitors, including dealers, are most welcome! We'll offer talks and field trips, as well as exhibits. Would you like details? Please reply to me, or Des Beechey (26 Malga Avenue, Roseville, NSW 2069 Australia Phone 61(2) 9417 4980 FAX 61(2)9217 0158 Email: des@phm.gov.au) from the organising committee for specific info.

Patty Jansen

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COA TROPHY WINNERS

edited by Charlotte Lloyd



Marilyn Lucarelli of Ballston Spa, New York took the COA Trophy for her exhibit "The Genus *Pterynotus* Swainson, 1833" at the Southwest Florida Conchological Society Shell Show, Feb. 28-Mar. 1 at Ft. Myers Beach. Marilyn also won Shell-Of-The-Show with her specimen of *Siphonochelus longicornis*. Marilyn then turned around and won the COA again 5 days later at the Sanibel Shell Show for "The, Subfamilies: *Tripterotyphinae* and *Typhinae*." This exhibit gave taxonomy and presented photos and graphics, Subfamily descriptions including similarities and differences, distribution and references. Look out fellow competitors - Marilyn is "Sweeping the Shows!"



Jim Vunkannon's exhibit, "Shells of Jamaica," won the COA Trophy at the Marco Island Show on March 13-15. The show had over 1,500 visitors during the three days open to the public. Congratulations, Jim!



Doris Underwood was thrilled to win the COA Trophy for "Polynesian Melange" at the Astronaut Trail Shell Show in January of this year. Her exhibit featured specimens and display items from Easter Is., Hawaii and French Polynesia. Nice work, Doris!



Shell Show Competitors Beware! Gene (*Super Sheller*) Everson now has a unique shelling buddy (pictured above) to help him find even better and rarer shells. *The word is out!*



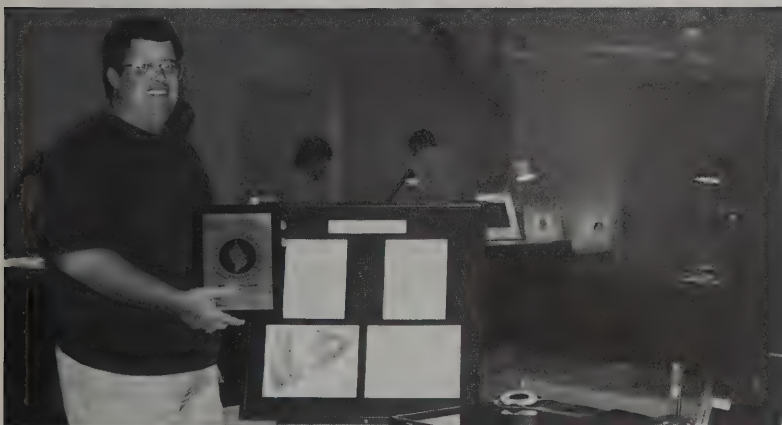
Bob Pace picked up the COA Trophy at the Broward Shell Show held on Jan. 31-Feb. 2, 1997 for "Self Collected Shells of Florida and the Caribbean." His exhibit was a culmination of 22 years of snorkeling and SCUBA diving and was presented in 16 cases representing 40 feet of display footage. Bob also won Shell-Of-The-Show at this event. Way to go, Bob!



"Volutes by Genus" were presented by Herbert and Andrea Brunhofer at the Philadelphia Shell Show November 9-10, 1996. Their exhibit represented the Family *Volutidae* by dividing it into 47 Genera and explaining the makeup of each Genus, a feat which awarded them the COA Trophy. Nice work, Brunhofers!



At the 1996 North Carolina Shell Show the COA Trophy went to Gene Everson for his "Seashells of Australia." The shells were all self-collected, mostly by SCUBA, snorkeling and dredging and included such rarities as *Austroharpa punctata* and *Phalium adcocki*. (Photo by Vicki Wall) Gene also won the COA Trophy at the Gulf Coast Shell Show for his 38' exhibit, "Seashells of Africa." This exhibit covered the mollusks from the entire continent of Africa with background maps showing each faunal province, water currents, temperatures and more. How many COA Awards does that make now, Gene? We understand he won the very first COA Trophy ever awarded.



COA member Craig Caddigan of Port St. Lucie won the COA Trophy at the Sarasota Shell Show held Feb. 14-16, 1997. The single case exhibit, entitled "*Entemnotrochus adansonianus*," showed growth, color variations, and an in-situ photo of one of the specimens, along with information on its habitat, diet and collection locations.



Donald Dan presented the COA Trophy to a very happy Patrick Anseeuw at the 6th Belgian International Shell Show last May 4 & 5 for his exhibit entitled "Living Worldwide *Pleurotomariidae*." The decision of the judges was based on the fact the collection was complete, with representative specimens of 23 different living *Pleurotomariidae* including photography and model of living *P. hirasei*. Certainly well deserved - Congratulations, Patrick!

(Continued on page 10)

COA TROPHY WINNERS *(Continued from page 9)*



Three cases of "Florida Fighting Conchs" won the COA again for Bob Pace at the Greater Miami Shell Club's Show in January of this year. The display included egg masses, growth series, taxonomy, freaks and forms from various locales. Great job Bob! We understand it was the Division winner as well.



Dick Plester won the COA Trophy for his outstanding display of *Costellariidae* at the 1996 British Shell Collectors Club Shell Show. It is easy to see why this artistically presented display won the coveted award.

The St. Petersburg Shell Show, held on Feb. 28-Mar. 1 of this year saw Dale Stream win the COA for his exhibit, "Fossil Pectinidae of the Atlantic."

1997-98 SLATE OF OFFICERS

The Nominating Committee of the Conchologists of America announces the slate of officers for consideration for 1997-1998. This slate will be voted upon at the General Meeting of the 1997 COA Convention in Captiva Island on Tuesday, July 15, 1997.

The slate is as follows:

President: **Dave Green**, Houston, Texas
 Vice-President: **Linda Brunner**, Southport, Florida
 Secretary: **Jean Roe**, Portland Texas
 Treasurer: **Bobbie Houchin**, Louisville, Kentucky
 Trustee: **Rosalie Taylor**, Austin, Texas

The 1997 Nominating Committee consists of Larry Stiles, Fern Park, FL, Glen Deuel, Huntsville, AL, and Eleanor Hillman, Indialantic, FL and is appointed by COA President Dave Green with the approval of the Executive Board of COA

LAST CHANCE TO DONATE FOR THE AUCTION

Next month is the convention in Captiva and the auction preparations are moving along nicely. For you latecomers, there is still time to send donations for the oral and silent auctions and door prizes. Books and shell related items are welcome donations.

Send donations to:

Margaret Thorsen
 1440 Middle Gulf Drive #3-B
 Sanibel Island, FL 33957
 (941)472-4094

Remember that the proceeds go to fund the very important COA Grants Program and the *American Conchologist*. Give generously!

Answers to Betty Hunter's "Know Your Muricidae"

1. *Chicoreus ramosus* (Linné, 1758)
2. *Dermomurex bakeri* (Hertlein & Strong, 1951)
3. *Homalocantha scorpio* (Linné, 1758)
4. *Dermomurex indentatus* (Carpenter, 1857)
5. *Dermomurex obeliscus* (A. Adams, 1853), *Aspella pyramidalis* (Broderip, 1833)
6. *Naquetia capucina* (Lamarck, 1822)
7. *Pterynotus lightbourni* Harasewych & Jensen, 1979
8. *Phyllonotus duplex* (Röding, 1798)
9. *Pterynotus vespertilio* (Kira, 1959)
10. *Siratus articulatus* Reeve, 1845
11. *Murexiella cirrosa* (Hinds, 1844)
12. *Siratus virgineus* (Röding, 1798)
13. *Favartia minatauros* Radwin & D'Attilio, 1978.
14. *Aspella pollux* Radwin & D'Attilio, 1978,
15. *Favartia poormani* Radwin & D'Attilio, 1978
16. *Aspella cryptica* Radwin & D'Attilio, 1978
17. *Chicoreus artemis* Radwin & D'Attilio, 1978
18. *Haustellum tweedianum* (Macpherson, 1962)
19. *Bizitiella carmen* (Lowe, 1935)
20. *Litozamia rudolphi* (Blazier, 1894)
21. *Chicoreus benedictinus* (Lobbecke, 1879)
22. *Murexiella hidalgoi* (Crosse, 1869)
23. *Chicoreus corrugatus* (Sowerby, 1841)
24. *Haustellum wilsoni* D'Attilio & Old, 1971
25. *Nipponotrophon gorgon* (Dall, 1913).

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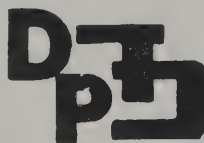
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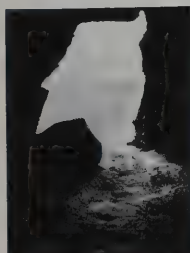
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COLLECTING IN THE SOLOMONS — JUNE 1996

(Or No Wonder Gene Came Home With a Grin on His Face!)

by Gene Everson

If you are like me, you find it disappointing to read about a shell trip to a wonderful sounding marine area, only to find it is 90% about the country, and the other 10% is about all the money cowries or tulip shells that were found. I want to use my 90% to tell you about the shells I found — those that would appeal to me, and hopefully to you.

In June, 1996, I went on a collecting trip to the Solomons. Our group included Wayne Harland, Homer Rhode, Karlynn Morgan and myself. We arrived at Honiara, Guadalcanal, the capital of the Solomon, on June 9th. We boarded the *Wyuna*, with Brian and Mary Claire Bailey, and we began collecting that same day. Snorkeling near the mouth of the Lungga River in very poor visibility, on dark sand, we found *Conus monachus* at 10' and deeper under rocks, and in the open, *C. figulinus*, *Thais buccinea* on a silty log, and *Oliva vidua*. That night, using SCUBA at 50-65' depth, we collected *Terebra commaculata* at the end of a sand trail, and *Murex tenuirostrum*, *Cypraea onyx melanesiae* and *Oliva rufula*, all in the open. A second dive that night off the Honiara Airport, starting at about 100' and working up to 15' on a silty slope, yielded *Conus hopwoodi*, *C. betulinus*, *Strombus marginatus septimus*, *Cymatium gutturnium*, *Trigonostoma obliquata*, *Glycymeris reevei*, *Phalium areola*, *P. bisulcatum*, pretty *Natica undulata*, *N. alapapilionis* and *N. vitellus*. Oddly enough, whenever we found *Conus betulinus*, it had another species on its back, *Trigonostoma obliquata*, for instance. The *Phalium areola* was crabbed. We also found *Murex salomonensis* and *M. tenuirostrum*, but I won't mention them again, because we found them at many sites at night.

The next day was spent traveling; we anchored for the night and dove at Vulalua Island. The depth was 35' on a silty bottom. We collected *Harpa amouretta* out on the sand, crawling with its

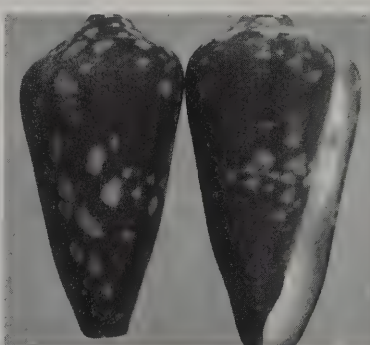
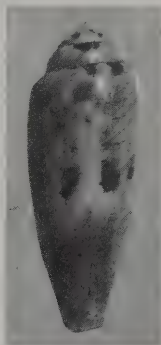
wide, fleshy foot, *Strombus labiosus*, *Bursa tuberosissima* and *B. rana*. *Conus pohlianus* (which the latest cone book calls *C. consors* form *pohlianus*) and an unusually marked *C. leopardus* with markings much larger and fewer than normal were both at the base of a small reef on sand at about 30'. The following morning, some of us walked on exposed flat reef along the shoreline. *Thais tuberosa* was abundant and I found my first *Turbo sparverius* and a large, 81mm *Asaphis violascens*.

We left Guadalcanal and crossed over to the Florida Islands group. Killing time 'til dark, we snorkeled at Nuggu Island, where we found *Conus episcopatus* under a rock, and several common species such as *Cypraea arabicula*. Our night dive, at Mandoleana Island, yielded *Fusinus colus* at 90' on sand, *Chicoreus paini*, *C. axicornis* both crabbed on the sand and rubble slope and a *Harpa harpa* at 55' on sand. A *Cypraea cribraria* was at 10' on a coral head, and *Conus ammiralis* was at 90' while *C. planorbis* appeared at 20' on the side of a log in algae.

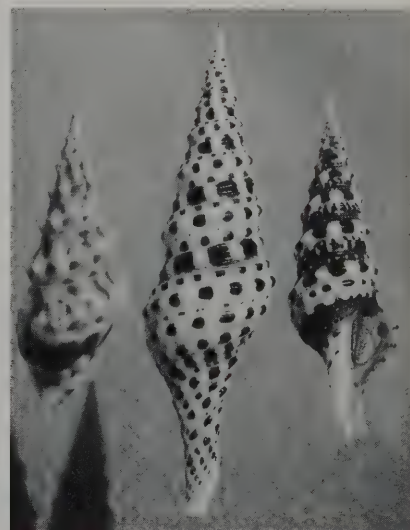
We dove Mbungana Island the night of June 12, on a sloping reef with sand and rubble and coral heads, to find *Turridrupa cerithium* on reef sand and one of the prettiest of all turrids, *Turris spectabilis* at 47' on a small rock. Also found *Latirus gibbulus* in sand and rubble, the lovely *Nassarius glans* at 27' on reef sand and a 99mm crabbed *Cymatium pileare*. On the 13th, we snorkeled in a small lagoon at Aviavi Island. I found a 107mm *Mitra mitra* nearly buried. I spotted a fleck of orange and fanned it up. Common, but excellent, specimens of *Tectus conus* (66mm) and *T. triserialis* (42mm) were at 6-8' on coral heads, and my first *Spondylus varius* was attached to dead coral.

That night we dove the unique Mboli Passage, on Nggela Island. About the width of a freshwater stream and sporting a current requiring a drift dive holding rope attached to the boat, this passage provides several habitats on a single dive. You can

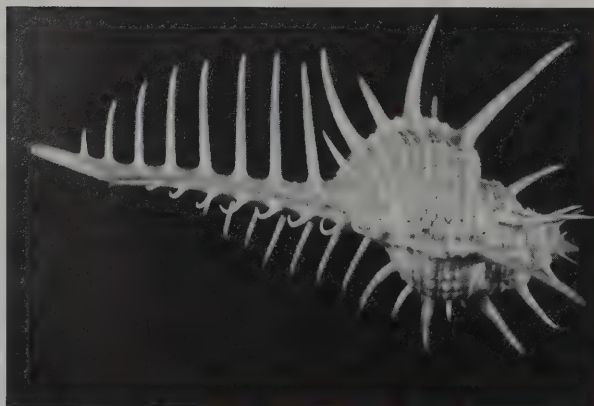
Conus viola



Conus crocatus



Conus gloriamaris



Murex salomonensis

Clavus flammulatus, *Turris babylonia*, *Turris spectabilis*
All photos by Charlotte Lloyd

encounter sand with delicate soft corals, silty mud, coral reef areas, or gravel bottom, all coming by you very quickly in poor visibility. Among the soft corals were *Cypraea bregeriana*, *C. onyx melanesiae*, *Margovolva bimaculata*, and *Volva volva*. On the sand was *Murex pecten*, *Conus acutangulus*, *Architectonica perspectivum* and *Gyrineum pusillum*. On the mud was *Placomen calophyllum*.

On the 14th we snorkeled off Siota, the small village where the Mboli Passage empties into the sea. There were *Conus stramineus*, *C. leopardus*, *C. striatellus*, black *C. marmoreus* and *C. magus*, as well as a crabbed *Voluta rutila* and a lovely white crested tellin, *Tellina capsoides*, all on sand. Wayne found a pair of *Ovula ovum* which he photographed and returned to their coral head. That night we dove and snorkeled at Siota. I collected *Turris babylonia* and another turrid I had hoped to get, *Clavus flammulatus*, at 8' on sand and rubble, a pair of nice *Pterygia fenestrata* at 8' in sand trails, *Harpa major* and *Pyramidella acus*. *Mitra eremitarum* was on a coral head feeding on a worm inside the coral. Its proboscis was extended so far I had to break it to pull the mollusk off. I also took a live 86mm *Cymbiola rutila* with SCUBA at 45' on sand and rubble there.

The next day, the 15th, we snorkeled Anuha Island and found common species. That night we dove there and I found *Polinices maura*, the only black *Polinices* I can think of, with a white animal. A 90mm *Mitra papalis* was at 30' on reef top rubble, as well as *Conus moreleti* and my largest *Conus geographus* (104mm), the last at 78'. Next day we snorkeled at Buena Vista Island by day and dove at night. There was *Cypraea nucleus* on coral, *Latirus lancea*, and a crabbed *Homalocantha anatomica* — they're so camouflaged I'd never have found it if it was live, and Homer found one of the few shells that he really wanted, a fine *Conus ammiralis*, on sand.

The next morning we departed the Florida Islands and returned to Guadalcanal. Then the collecting got good! That night, diving at Kakombona on a sand slope, Wayne and I each found our first *Conus gloriamaris*, and each was a gem, at 63' on a sandy slope! There was also *Conus generalis*, *Strombus minimus*, *S. plicatus*

pulchellus, *Casmaria erinaceus*, several colorful *Phalium glaucum*, and under a rusted slab of sheet metal, a beautiful *Chama pacifica*.

On the 18th, we went back near the Lungga River mouth and put on tanks to dive the silted poor-visibility slope in search of logs to push our hands under while hoping to avoid the dangerous fins of the Butterfly Cod. This hardest dive, physically, was worth it. Karlynn and Homer each found a *Conus gloriamaris* under the same log, and the specimens were larger than the two that Wayne and I had found.

That night, and the next, we dove Mamara Point and had our best finds of the trip. Between Wayne and me, we found five *Conus crocatus*, in among dead coral fingers, three of which were giants over 60mm. The other three divers found *Conus bullatus*, while I collected *Conus viola*, *C. circumcisis*, *C. legatus*, *C. litoglyphus*, *C. muriculatus sugillatus*, *C. imperialis*, *C. omaria* and other cones, all in the same coral habitat as the *C. crocatus*. I also found there a large 21mm *Psilaxis* (syn: *Philippia*) *radiata*, *Coralliophila admirantium*, *Vexillum zelotypum* and more. Between these night dives, we day-snorkeled off downtown Honiara where the best shell was found by Karlynn, a nice, large *Conus varius*, sitting on a coral head right by the downtown seawall.

We were to depart from Fiji on the morning of June 21st, so the 20th was spent packing and transferring our gear from the boat to a hotel. Karlynn and I made one last night dive at the nearby Point Cruz on a reef down to 75'. There was *Lyrocardium lyratum*, fresh dead on reef sand, a 6.5 inch black hammer oyster, *Malleus malleus*, my first *Cymatium lotorium*, *Conus emaciatus*, *C. vexillum*, and we each found *Conus circumcisis*.

This was the second trip to the Solomons for Wayne and me, both of them with Brian Bailey aboard the *Wyuna*. We found many species on this trip that we did not find on the first, and bigger and better specimens of some of the species we found on the first trip. Brian is THE expert, and if (I say IF) his boat and compressor are in working order, any shelling trip with him as a guide is sure to be a success.

In Memoriam

DES HINTON

Des Hinton, President of the Whitsunday Shell Club, Queensland, Australia, died on February 21, 1997. He was well known for his many shell show displays. At the 1996 Keppel Bay Shell Show, he was awarded the COA Trophy for his unique exhibit of "Shells with Colorful or Unusual Apertures." Des was a fine gentleman and will be missed by all who knew him.

—Gloria Scarboro

FLOWERS TO:

Herb Young, old friend, former COA President and longtime member, who was released from the hospital April 15 following a three-month stay, recuperating from some very serious surgery to improve a respiratory condition that has been plaguing him. Last we heard, Herb was still wheelchair-bound, but his old grit and determination was back, and he had plans for a course of exercise therapy to get him up and about again. Our best to you, Herb, and we hope we'll see you next month at Captiva. (Herb has only missed two COA conventions since he became a member back in the early days of our history, likely an unbeatable record.)

We wish to thank longtime staff member **Jack Odenwald** for his many years of faithful and timely service in preparing and supplying mailing labels for the American Conchologist. Jack, you made our job so much easier! We'll miss you.

Congratulations to **Dr. Donald and Eloise Bosch** who were profiled in a feature article in the *Washington Post* (3/31/97). Their careers, their new species from Oman, and their marvelous new book, *Seashells of Eastern Arabia*, all are detailed in an informative and very complimentary article.

Congratulations to **Tom Rice** also. *The Dredgings*, newsletter of the Pacific Northwest Shell Club (Seattle, WA) features a sensitive and imaginatively written "Profile of a Sheller: Thomas C. Rice" by Aretta McClure, current PNSC President. Ten pages long, this much-deserved tribute to the career of an amazing sheller is well-illustrated with photos of Tom's world, including excellent pictures of Tom from toddlerhood til today. Don't miss it!

After the Big Blow...

from Australian correspondent Patty Jansen

It is not often that you get the opportunity to go through a tropical cyclone and come out unscathed at the other end. In fact, the last time a cyclone hit Townsville (Northern Queensland, Australia) was in 1971, long before I moved there. Residents are still talking about it in terms of pre-Althea and post-Althea. Althea, of course, being the name of the cyclone. It virtually destroyed large sections of the town and residents were more preoccupied with salvaging their precious belongings from the rubble of what used to be their houses than looking for shells on the beach.

So when, at 10 pm on Sunday 23rd of March 1997, the cyclone sirens started to be played hourly on the radio and tv, none of us, and especially those who lived through Althea, jumped to cry out "You beauty!", as in hindsight we probably should have. The cyclone was only a category 1, the weakest on a scale from 1 to 5. It kept most of us awake for a large part of the night and it got pretty scary at about 3 am, just before the eye passed over Townsville. The wind and the huge amount of rain that fell — horizontally — that night caused a lot of damage to crops and other green things, but minimal damage to houses. Unless, of course, you happened to be in a temporary watercourse.

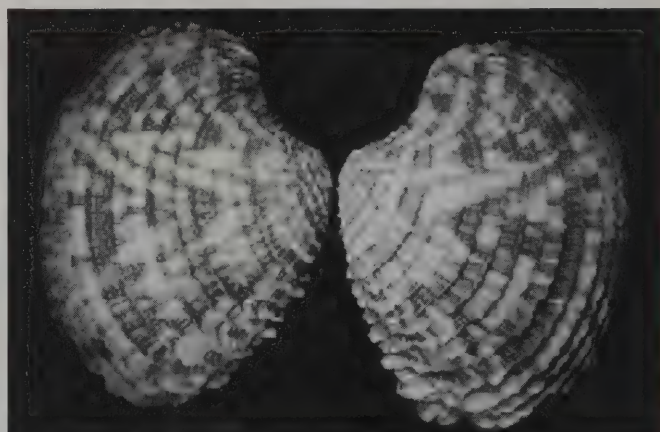
On Monday, every road out of town was under water, or had trees, mud or rocks across it, so nobody was going anywhere, but the first collectors made it to the beach on Tuesday. And what a feast it was! Most of the coastline is protected and beaches are very gently sloping with minimal surf. On Sunday, however, I could see the surf pounding the beach through sheets of rain from the front veranda of our home. It had brought in many live shells, mainly bivalves, some of which we rarely ever find on beaches, in broken or separated condition. Examples of such species were *Semele casta*, *Acrosterigma impolita* and *Pitar trevori*. The high tide line at Three Mile Creek, one of our favorite collecting spots, was littered with specimens of *Pinna bicolor* and *Atrina pectinata*. I found live specimens of four species of Pectens; *Mimachlamys gloriosa*, *Chlamys dringi*, *Decatopecten strangei* and *Cryptopecten nux*. The cardiid *Plagiocardium setosum* was common in shell deposit. It has a periostracum of long hairs, but soaking in bleach will reveal a beautiful pink and white shell. It is very similar to another species, *Plagiocardium pseudolatum*, which we also found. The latter species is more elongate and more pink and purple. Venerids were common of course, especially *Katelysia hiantina* and *Tapes dorsatus*, but also found several specimens of *Antigona lamellaris*, completely covered in sponges and still alive. They took some cleaning!

11 Eden St., Belgian Gardens, Q'ld. 4810, Australia. Email Patty at: filejest@internetnorth.com.au

*Antigona
lamellaris*

At Saunders Beach, north of Townsville, we found many specimens of the lantern shell *Laternula valenciennesi*. Glenda collected a whole heap of them. I personally don't like the things for the simple reason that I never seem to be able to keep them in one piece for very long! In the gastropod department, there were the usual naticids and nassariids, but also a beautiful specimen of *Tonna perdis*, and *Cypraea errones* and *Cypraea pyramis*, still alive or with dead animals. Saunders Beach yielded many *Murex brevispina macgillivrayi*, some still with the animal, and *Architectonica perdis* and *A. perspectiva*. There were also magnificent specimens of the turrid *Inquisitor formidabilis*, which were very fresh and had a beautiful deep orange colour. Beach specimens are usually yellowish white so they were a real treat. I was very happy to find several really good *Strombus campbelli* and its sister species, *S. vittatus*. These species have been confused a lot, but when you get familiar with them, it is pretty hard to see why. *S. campbelli* is much lower spired, has less incised sutures and has much more colourful patterns than *S. vittatus*. Further south, they usually find many good Ovulidae after rough weather, but we only found a few pretty ordinary specimens of *Primovula pyriformis*, *Margovula bimaculata* and *Prinovula brevis*.

We came back with bags full of shells, which were taken into the club meeting for display, where we all marvelled at each other's finds. Most of the shells that we couldn't collect have since washed back into the ocean, except for those that were deposited above the high tide line; these are quickly deteriorating under the influence of the tropical sun. But I am convinced that this one incidence will start off a period of good collecting, just as the previous five dry years have been particularly lousy.



KAREN COUCH WINS CONSERVATION AWARD

COA's own Karen Couch, Olathe, Kansas, has received recognition for her work with the river mussels of that state. At the Kansas Wildlife Federation's annual banquet in March. She was named the Water Conservationist of the Year for 1996. The following is excerpted from the award announcement:

"Karen has used her lifelong interest in shells to advance the awareness of water conservation and to alert Kansans about this valuable and often rapidly disappearing resource. . . . Karen's real love is mussels and she has been zealous and untiring in trying to determine the cause of mussel depletion throughout Kansas. . . . Her artistic endeavors have been recognized out of state- she won the coveted DuPont Award while showing a display at the Philadelphia Academy of Science two years ago. Because of this, she was invited to show at the American Malacological Union Conference at the Field Museum in Chicago in June, 1996. . . . All this effort has been undertaken with her own resources and through her own personal determination. She wants nothing more than to raise people's awareness of this unique natural resource and its link to water quality problems, stream habitat degradation, and stream dewatering... Many Kansans have been very impressed with Karen's tenacity and dedication."

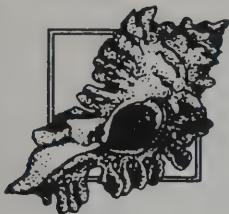
Karen, a COA cover artist, bourse participant, and contributor to the pages of *American Conchologist* [23(3):25-28], also has a book on the unionidae of Kansas due to appear late this summer. Congratulations, Karen. Amateurs everywhere are encouraged by your accomplishments.



Karen Couch at the Corpus Christi COA Bourse

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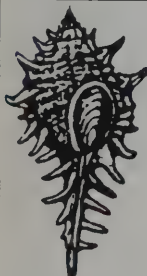
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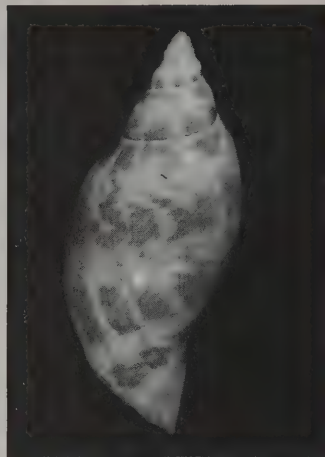
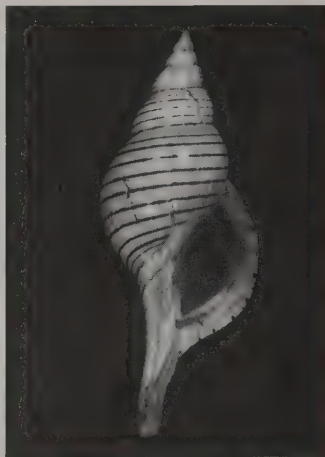
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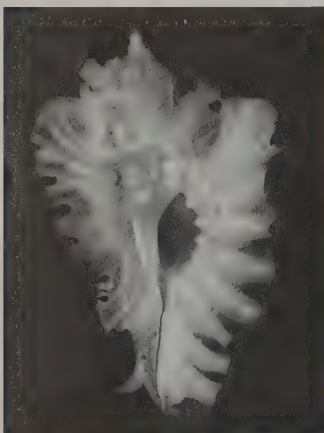
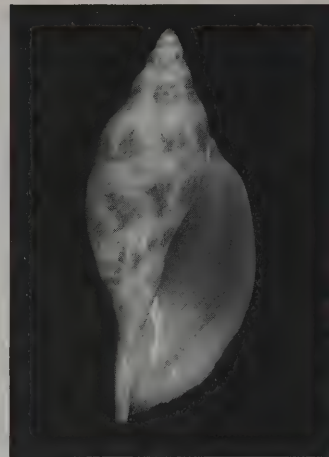
by Kevan and Linda Sunderland



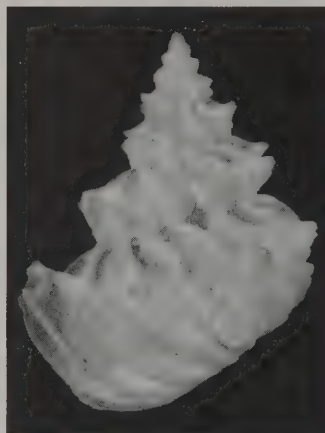
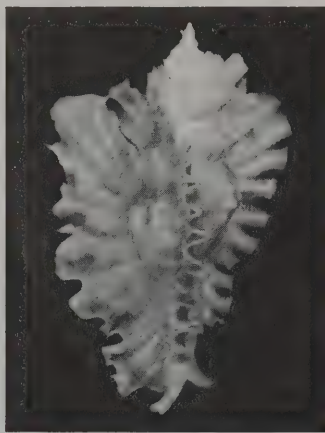
Fasciolaria liliun branhamae Rehder & Abbott, 1951. 115 mm. 400 feet, dredged in muddy sand, Gulf of Mexico. Ex. Gene Everson collection.



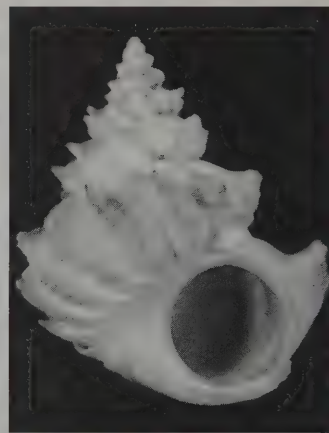
Scaphella contoyensis Emerson & Old, 1979. 152 mm. Trawled from 46 meters, off Contoy Light, Mexico.



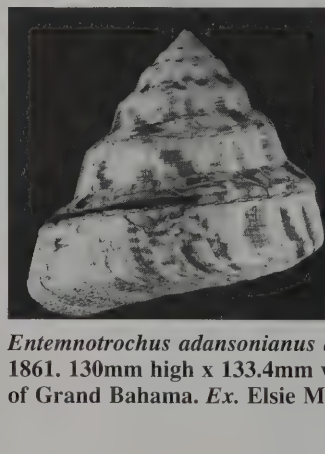
Pterynotus phyllopterus (Lamarck, 1822). 76.7mm. Live taken, in reef, Martinique. Ex: Everett collection.



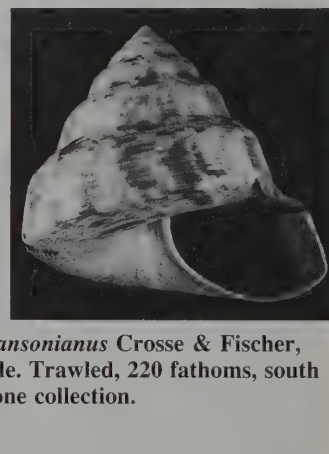
Sthenorytis turbinus (Dall, 1908). 44.7mm. Dredged, 200 meters, off Santa Cruz, Galapagos. Ex: Gene Everson collection.



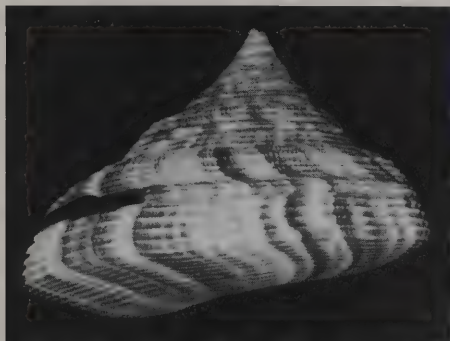
Conus adamsonii Broderip, 1836. 53.3mm. Canton Island, Phoenix Group, South Pacific. (collected 3/1/58)



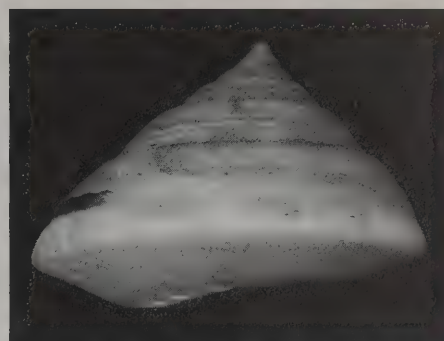
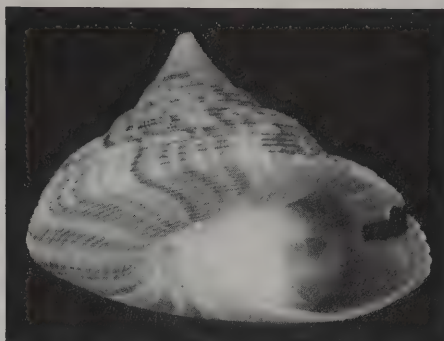
Entemnotrochus adansonianus adansonianus Crosse & Fischer, 1861. 130mm high x 133.4mm wide. Trawled, 220 fathoms, south of Grand Bahama. Ex. Elsie Malone collection.



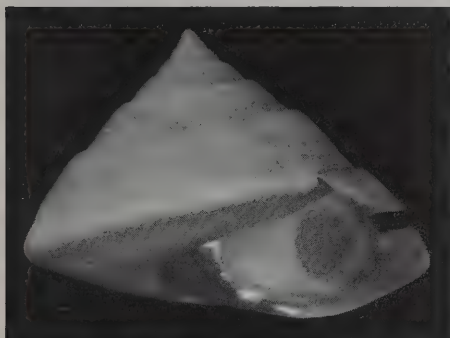
Specimens pictured are in the possession of the Bailey-Matthews Shell Museum, Sanibel Island. Donor collections are noted if known. Our thanks to Museum Director Jose Leal for his kindness and effort in making this possible.



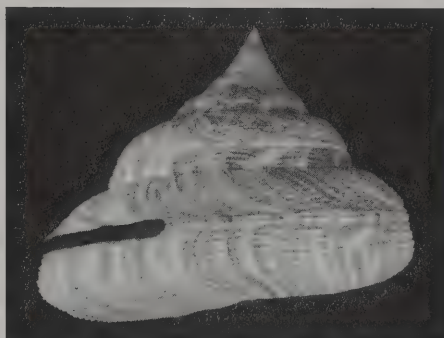
Peretrochus amabilis (F.M. Bayer, 1963). 73.2mm high x 90.0 wide. Dredged by Riley Black off Dry Tortugas, Florida. Ex. Cora Staples collection.



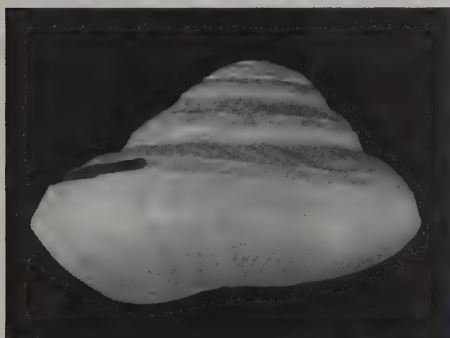
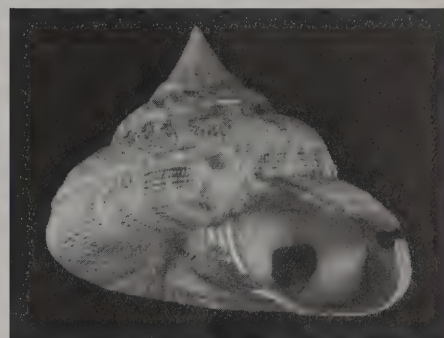
Peretrochus lucaya F.M. Bayer, 1965. 26.5 mm high x 35.5 mm wide. Trawled, 240 fathoms, off Abaco, Bahamas.



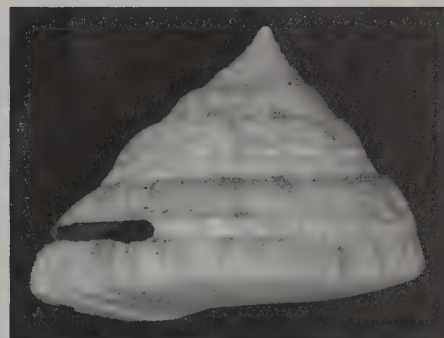
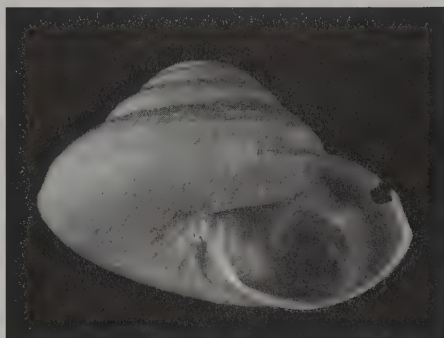
Peretrochus lucaya F.M. Bayer, 1965. 26.5 mm high x 35.5 mm wide. Trawled, 240 fathoms, off Abaco, Bahamas.



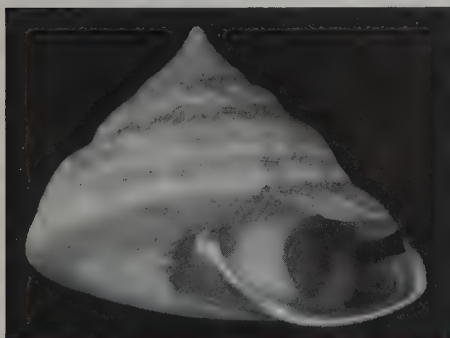
Peretrochus maureri Harasewych & Askew, 1993. 35.6 mm high x 45.7mm wide. Off South Carolina.



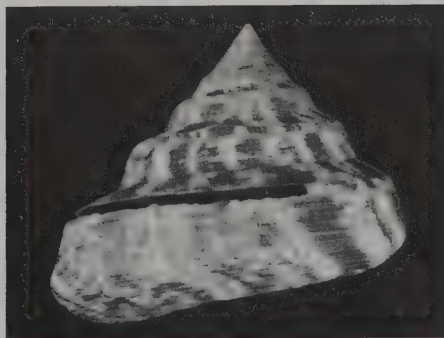
Peretrochus midas F.M. Bayer, 1965. 58.2 mm high x 89 mm wide. Trawled, "very deep," off Great Stirrup Cay, Bahamas. Ex: Elsie Malone collection.



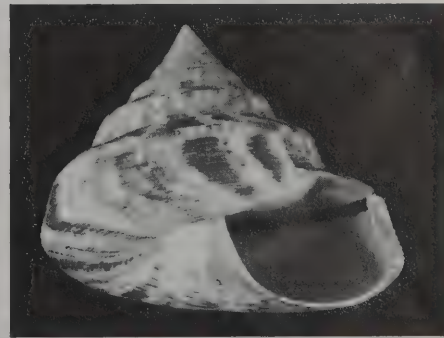
Peretrochus quoyanus quoyanus Fischer & Bernardi, 1856. 41.9 mm high x 55.4 mm wide. 240 fathoms, off Lesser Antilles. Ex: Elsie Malone collection.



Peretrochus quoyanus quoyanus Fischer & Bernardi, 1856. 41.9 mm high x 55.4 mm wide. 240 fathoms, off Lesser Antilles. Ex: Elsie Malone collection.



Entemnotrochus adansonianus bermudensis Okutani & Goto, 1983. 68.7 mm high x 83.9 wide at base. Crabbed in pot, 210 fathoms, 1 1/4 miles south of Gurnet Rock, south shore of Bermuda. July 10, 1991 Ex: J.R.H. Lightbourn collection.



JUNONIA

by S. Peter Dance

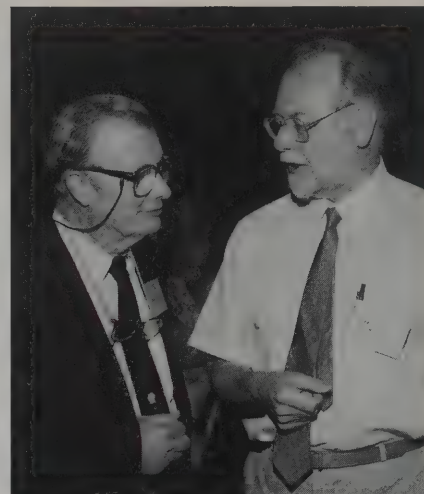
Sacheverell Sitwell may have been the first to point out that seashells enliven the foreground scenery of several of Audubon's bird plates. Scattered on the dull rocks and sands against which Audubon portrays some of his seabirds, they reminded Sitwell of the folding double frontispiece to Utamaro's *Presents of the Ebb Tide* which portrays a group of ladies walking on a shell-strewn shore. Dating from about 1790, this Japanese woodcut book includes, besides the gold-and-silver-embellished frontispiece, a series of plates of shells, hand coloured with rainbow tints. Known to me only from Sitwell's description, I should give a day of my life to see and handle it. The first edition of *The Birds of America*, published between 1827 and 1838, is another book worth that kind of sacrifice. Indeed, I did spend a day of my life, at Paisley Public Library in Scotland, handling and studying a complete copy of Audubon's magnificent, if ungainly, book. It was then, long after Sitwell had done so, that I noticed the seashells decorating — for that is what they do — some of Audubon's seashores.

My eye was drawn particularly to plate 409, showing two terns standing rigidly at the edge of a cliff looking out to sea. Near their feet lie two seashells and a sea urchin. I recognized the larger of the two seashells as a *Junonia* (*Scaphella junonia*), known only from localities around the south-eastern United States and the Gulf of Mexico. A moderately large, thick-shelled volute ringed about with large, brown spots, it normally lives off-shore. I assume its presence at the edge of a cliff in the aquatinted plate was to satisfy an artistic purpose. Whatever the reason, this illustration shows a shell considered very rare and desirable in Audubon's day. When his book was published, collectors considered no volute more desirable. In 1828, a London shell dealer Charles Dubois, said that "Perhaps not more than four can be traced in Europe." A few years previously another London-based shell dealer, John Mawe, had said in his *Shell Collector's Pilot* that he had received the *Junonia* from the Philippines. So Audubon's aquatint may represent the earliest correct indication of a locality for it: the southeastern seaboard of the United States.

But why *Junonia*? Or *Junonia's* Volute? Such a name demands an explanation and I have looked for one, with little success. *Juno* is the Roman version of *Hera*, the Greek goddess of marriage and childbirth. She was the sister and the wife of *Jupiter* (*Zeus* in the Greek Pantheon) whose many love affairs made her jealous and spiteful. Usually portrayed as a lady of stately or austere beauty, she has had her name bestowed on several members of the plant and animal kingdoms. Among plants there is a white lily, sometimes called *Juno's Rose* (*Lilium candidum*); and the pink-flowered *Vervain*, (*Verbena officinalis*), which, according to Gerard's *Herbal of 1597*, was also called "*Juno's Teares*." In the animal kingdom there are two or three insects (including *Dione juno* Cramer, a butterfly, and *Stigmodera junonia* Laporte and Gory, a beetle) and at least two other molluscs, (*Helix juno* Pfeiffer and *Cardium junonia* Lamarck — now known as the True Heart Cockle, *Corculum cardissa* Linnaeus. As there is no distinctive visual feature shared by any of these, I conclude that Lamarck (following J.H. Chemnitz) called it *Voluta junonia* because he considered the shell to be a majestic but somewhat feminine object. Also it was customary then to apply a scientific name to an animal or plant based on a name purloined from classical mythology. The rows of large spots, distinguishing it from all other volutes, seem to have no relevance to the choice of name in this instance. Presumably *Juno*, unlike her spouse, was spotless.



S. Peter Dance with Tucker Abbott at the Long Island COA Convention in 1990. Peter Dance was Banquet Speaker that year.



I included the *Junonia* in my book *Rare Shells* (1969) because of its former celebrity and because it was — and still is — one of the more attractive and desirable of the many different existing volutes. So it is not surprising that I looked out for it during a lengthy sojourn in Florida. There was no shortage of examples in the many private collections it was my privilege to see when there in 1971, and I could have bought a dozen from as many shell dealers. But *owning* a *Junonia* was not the same as *finding* one. Most of all I wanted to find one at Sanibel Island. This was my first visit to that island where the streets are named after shells, where conchology is a religion, where no one walking on a beach looks anywhere but down, where *everyone* wants to find a *Junonia*. I was confident that enthusiasm combined with optimism and a little luck would be enough for me to find one.

There had been some strong on-shore winds before my arrival and the beaches were littered with shells, strings and bunches of molluscan eggs, dead horseshoe crabs and other flotsam. My chances of finding a *Junonia*, I thought, must have been increased immeasurably by this circumstance and I wandered the sandy beaches in the confident expectation of swooping down upon a *Junonia*, a rare Golden Olive, or some other Sanibel treasure. There were many beached shells around Sanibel in February 1971. The locals thought there were only too many. I saw them wrinkling their noses while shoveling piles of shells into deep pits dug in the sand. Each day I walked the sandy beaches, expecting to find at least one or two rarities. Each day I waded into the sea up to my knees, hoping to forestall a discovery by one of the army of collectors scouring the beaches for stranded treasures. The only reward for my adventurousness was a dozen sea-urchin spines embedded in my ankle.

On the day before my departure from the island I considered the options for discovery still open to me. I had explored almost every available beach, had even done so at night with a torch. I wondered what treasures might have been shovelled into the sand pits and considered buying a spade, but the thought of excavating their unsavoury contents checked me. Briefly I was tempted to pay the going price for a pristine example of my heart's desire in one of the island's shell shops. But paying the going price for a shell, or anything else, is merely a transaction. Besides, it would have been to admit defeat. I resisted the temptation and resigned myself to the likely prospect of leaving Sanibel without a *Junonia*.

With everything packed for my departure I took a final stroll along a beach crowded with shell seekers. Nonchalantly I shuffled along, occasionally kicking at the shells, driftwood and fishbones yet to be shovelled into sand pits. Sanibel had lured me with its reputation and I had made a pilgrimage to it in good faith, but it had ignored my homage and denied me its bounty. So many wasted hours, so many aches and pains, for nothing. I kicked another shapeless mound of flotsam into the sea, a fitting way to say good-bye to the shell collector's Mecca. The flotsam disintegrated. I watched the component pieces tumble about in front of me, a string of Lightning Whelk eggs, a moon snail, a grubby sea urchin, a

Lettered Olive — I had seen all these before, so many times — and a shell with large brown spots on it, *with large brown spots!* A Junonia! I pounced upon it, brushed the sand away and gazed at it disbelievingly. Turning it over on my hand I saw that a large part of the body whorl was missing and the lip was badly chipped. Dipping it into a pool, I saw that it was badly faded too. These imperfections mattered not. I had found my Junonia!

At the day's end I strolled into a shell shop where I had already struck up an acquaintance with the proprietor and reverently placed my shell on the counter. "There you are," I said. "I've done it! I've got one." The proprietor, who was dealing with a grey-haired little lady, looked at me and smiled. Then, saying nothing, she opened a small cupboard behind her and extracted three magnificent examples of the Junonia. Her customer surveyed the three beauties, then looked at my poor, broken shell. Her eyes twinkled brightly as she turned and touched me on the shoulder. In a quiet voice suggesting New York or Chicago, she said, "I think I know what you mean. Congratulations." I walked out of the shell shop, the happiest pilgrim on Sanibel Island.

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- Mawe, J. 1821. The Voyager's Companion, or Shell Collector's Pilot. 2nd edition. London.
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COA SURVEY REPORT

by Rosalie Taylor

Many thanks to all of you who filled out your survey and returned it with your membership renewal. The results were reported at the COA mid-year board meeting. Your participation helped the COA board of directors know what your wishes are for this organization. There were many good suggestions which the board appreciated. Dave Green will present a full report on the survey at the general membership meeting at the convention in July. The drawing for the \$100.00 prize will also be made at that time. Hope you plan to be there to collect your prize! In addition to Dave Green's presentation to the convention, a complete report will be printed in the September issue of the *American Conchologist*.

OOPS!

It is our bounden duty to inform you less-observant types (all the more-observant types informed us!) that the photo of two river mussels on page 3 of Brian McElaney's article on freshwater collecting in the March 1997 *American Conchologist* appears to have its caption wrong. What really happened is that the printers reversed the slide of the two river mussels, but failed to reflect their error in the caption. It's not so easy to tell with bivalves, is it? For the record, the shell on the right is *Quadrula quadrula*. (And for the purists among you, Dr. G. Thomas Watters points out that the shell on the left ought really be called *Pleurobema sintoxia*.)



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CONCHATENATIONS: Navigating Libraries

by Gary Rosenberg

Shell collectors are often frustrated by the inability to establish the correct name for a species. For the purist there is only one recourse—diving into libraries and reaching one's own decisions. The first necessity is access to primary literature—the original literature where the species were first named. Gaining access to primary literature can be difficult; this column gives some pointers on how to get a foothold.

There are only a few dozen institutions in the world, and fewer individuals, with natural history libraries comprehensive enough to answer most questions about mollusks. Because the catalogues of many major libraries are computerized, however, it is often possible to track down copies of desired works from scattered sources. Most research libraries will provide photocopies for a fee and, by this means, the conchologist can build up a substantial collection of original descriptions. If a computer search fails, another valuable resource is the *National Union Catalogue, pre-1956 Imprints*, which lists which research libraries in the United States hold what books. The *NUC* is gigantic, running to hundreds of volumes, and itself is held only by libraries of states, large cities and major universities.

In order to start requesting photocopies, you must at least have access to three important indices to the literature: Sherborn's *Index Animalium*, which covers 1758 to 1850; Ruhoff's *Index to the species of Mollusca introduced from 1850 to 1870*; and the *Zoological Record: Mollusca*, which covers 1864 to the present. These works generally tell only the page on which the description begins, so a request for photocopies must stress that the entire description is needed, along with any illustrations. Getting the entire article is preferable, if it isn't too long, since important information can appear in the introduction, or in entries for related species. Also make sure to get copies of the title pages of each book or journal; they will come in handy for tracking sources.

The first volume of Sherborn's *Index Animalium* attempts to list all species and genus names of animals published between 1758 and 1800, with their original citation. The next nine volumes cover species and genera from 1801 to 1850. Sherborn is about 95% complete for names of mollusks introduced between 1758 and 1850, and what he missed tends to be very obscure, so in practice, 99% of the time, one will find that Sherborn provides the exact page number in the book or journal where the species was named. Sherborn lists specific names in alphabetic order, with adjectives alphabetized in masculine form. This can be confusing at first, because, for example, "lata" (broad) will be alphabetized as "latus" and so come after "lateralis." Sherborn's system has advantages though, because all the forms of a name are in one block. For example, look up *Cerithiopsis lata* in the index of Abbott's *American Seashells* (1974); it is under "latus", three column inches away from "lata" and can easily be missed.

After 1850, matters are more difficult. Ruhoff lists species names for mollusks introduced from 1850 and 1870, but her work missed 30 to 40% of the names in this period and is weak for fossil mollusks. Ruhoff uses straight alphabetical order instead of taking into account gender of endings. From 1864 to the present day, the *Zoological Record* documents the place of publication of names, but to find a name requires knowing the year that it was published. Without the year, one must scan more than 130 volumes one by one, which is impractical. The last couple of decades of the *Zoological Record* are available online and can be searched for a fee. The *Zoological Record* is about 80% complete for species names of mollusks in the period it covers.

What if a name is not found in one of three works? One possibility is that the name was listed under a genus other than the one expected. These works list names under the original genus, which is not always easy to infer. For example, Röding (1798) named his species of *Conus* in the genus *Cucullus* and his *Oliva* in *Porphyria*. Scanning the list looking for names by the desired author might help. *Zoological Record* has an advantage here, because it

groups names by family or superfamily, so it is easier to recognize likely candidates. Sherborn is most difficult in this regard, since names from other phyla are mixed in, so there will be lots of unfamiliar genera. (Sherborn also has additions and corrections in the last volume, which are often overlooked.)

Another possibility is that the name is one that these indices missed. *The Royal Society Catalogue of Scientific Papers, 1800-1900*, in 16 volumes, can then be helpful. It provides a list of articles by author, in chronological order. Often the title of the article flags it as the likely place where a name appeared.

What if one doesn't know the date of publication, or even the author? *A Listing of Living Mollusca* by Goto & Poppe (1996) is the best source, listing about 40-50% of valid, living mollusk species, with greatest strength in marine mollusks. However, it does not list names thought to be synonyms, and so lists fewer than 25% of available names for mollusks. Goto & Poppe is essentially an index to most of the books and major monographs on mollusks published in the last 30 years, and so points to secondary sources that might lead one to primary sources.

Many other books and monographs might be useful for tracking down original descriptions in particular families or faunas. For example, the bibliography in Keen (1971, *Sea Shells of Tropical West America*) lists most of the papers where the species she treats were described, although without stating on what page particular species appeared. Vokes (1971, *Bulletins of American Paleontology* 61) gives the original citation for species named in the genus *Murex*. My own database on Internet provides citations for more than 6000 names of Western Atlantic gastropods (URL gopher://erato.acnatsci.org). These pre-existing lists can save months or years of effort.

If there is no list for a particular taxon, or the existing list is out of date, Sherborn, Ruhoff and the *Zoological Record* can be used to create a list. This is much more productive in the long run than tracking down names piecemeal as they are encountered in the secondary literature. Sherborn and Ruhoff both have indices by genera, so one can get a list of all the names in a particular genus. For example, a quick count in the index shows that Sherborn lists 149 names of *Haliotis*. Having compiled a preliminary list of names and citations in this fashion, one can request photocopies much more efficiently. It can be quite frustrating to get a photocopy of an original description and then discover two months later that there was a congeneric species named in the same paper.

Ordering photocopies goes only so far. There are inevitably citations that cannot be tracked down and works that cannot be found. Seeing colored illustrations can be essential for understanding what an author meant. At this point, it's time to visit one of the major natural history libraries. With appropriate preparation, more can be accomplished in a week on site than in a year of correspondence with librarians, however helpful they may be. Of course, once the literature is in hand, one must know how to use it to determine the correct name for species. That will be the subject of September's column.

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Santa Barbara Museum Shell-A-Bration

In conjunction with the AMU/WSM meeting this summer (22-27 June), the Santa Barbara Museum of Natural History is presenting a summer long event on mollusks. The summer "Shell-A-Bration" will include dazzling exhibits, lectures and fun activities for the public to learn about and gain appreciation for mollusks.

BOOK REVIEW

Taxonomic Atlas of the Benthic Fauna of the Santa Maria Basin and Western Santa Barbara Channel Volume 9 The Mollusca Part 2: The Gastropoda by James H. McLean and Terrence M. Gosliner. Edited by Paul H. Scott, James A. Blake and Andrew L. Lissner. Published by The Santa Barbara Museum of Natural History, 1996. 49 b/w plates. 228 + vi pp. paper bound. 8.5" X 11"

The mollusks of the west coast of North America are a varied and interesting fauna. The coastal waters of the eastern Pacific and the life that inhabits them are all strongly tempered by thermal barriers and cold currents from the north. Equally influential are the effects of species from the Indo-Pacific that flow into the region along both northern and southern routes. The central portion of this coast, extending from Point Conception north of Santa Barbara all the way down into Mexico along the Baja California coast, is known as the Californian Province. (North of Point Conception, all the way to S. Alaska, the molluscan fauna is recognized as the Oregonian Province. Running from the inner Baja coastlines of the Sea of Cortez down to Ecuador is the Panamic Province.)

In 1969 (rev. 1978) James McLean (Natural History Museum, Los Angeles) published *Shells of Southern California*, treating the northern section of the Californian Province, down to about 70'. In it he covered the mollusks of the habitats most accessible to man, the intertidal and sublittoral areas and the fertile kelp beds. Now Dr. McLean, and Terrence M. Gosliner of the California Academy of Sciences, return to this place where north meets south, Southern California, as the focus for a new identification manual. Addressing the same geographical area as McLean's 1969 guide, this new work has as its objective the benthic mollusks, those occurring offshore, out of easy diving depth down to about 500'. Here there is a low temperature variation — 50° - 70° — contributing to a very rich fauna, and one less common in collections than shells of the inshore areas. Intended primarily as an identification manual, the *Taxonomic Atlas* is less a picture book than many recently published works; instead it is a scholarly workhorse more along the lines of E. A. Kay's *Hawaiian Marine Shells*, with new species, revisions of genera, species lists, careful outlining of lab methods and conventions, as well as keys, glossaries, maps, collecting stations and extensive bibliographies. There is some species overlap with McLean's earlier work.

The guide is convenient structurally, being organized into two sections, or chapters. Dr. McLean has authored the first, that on the Prosobranchia (used in the traditional sense), and a continuation of the work he began in 1969. Dr. Gosliner authors the second chapter, "The Opisthobranchia." Each stands alone, with separate introductory and supplementary sections. All species are illustrated in crisp black and white photos, and drawings and SEM photos as well in the Opisthobranch section.

The introductory material to both chapters is extremely helpful for the amateur, to give him a good grasp on the higher level systematic and taxonomic changes that have occurred in the recent past, at least for the groups covered, and to explain them. The guide itself is an important addition to the literature. It pictures and discusses 126 species in the Prosobranch section, 7 of them new to science, and 29 species of Opisthobranchs, 7 of them undescribed. Many of the species are here pictured for the first time in a popularly available work.

The Prosobranch fauna covered is an interesting one, devoid of the usual cones, cowries, murexes and volutes. But there are a trivia, and two sinuinas. Lots of little eulimids. A host of Trophoninae, those coldwater murex so dear to collectors, inhabit the region, including four new to science. There's also a new Trophon genus, *Scabrotrophon*, erected here for those species having their dominant early sculpture spiral, and with scabrous spiral cords on mature specimens. The pure white *S. clarki* ns., strikingly beautiful with its fluting and ruffles and imbrications, is also satisfyingly large (43.4mm holotype) and rare (2). Another new species, the minute *Megalomphalus schmiederi*, has both the plenitude and elegance of ribbing of a *Harpa costata*, all in 2.5mm.

The Opisthobranch chapter is a useful and interesting one, and its introduction is a good jumping off point for an avid beginner in the group. Gosliner's introduction is excellent for this purpose. There are

almost 5,000 species, almost all marine, and these waters are rich with them. The species from deeper water are not well known, with most of the recorded taxa being shelled species described from dead shells. Both the shelled and the shell-less and internal-shelled species are covered here. Seven are undescribed species, and two genera were previously known only from the Atlantic.

This guide should be part of the equipment of any serious sheller. It, with McLean's earlier book, provides a good picture of the region's fauna. But should one's interest extend farther north, there's good news about a previously scantily covered fauna: Dr. McLean has, in the works, an illustrated manual of the entire Californian and Oregonian Provinces, covering 1,000 species.

COMING SOON:

An Illustrated Guide to Unionid Mussels of Kansas by Karen J. Couch

The first book exclusively on Kansas unionids in 35 years is expected to be available by August/September, 1997. Karen's new book will feature over 100 pages and a large (8.5" X 11") format. Each of the 45 species will be represented with color drawings accompanied by brief, easy-to-understand text. The book will be useful to persons of various levels of interest in Kansas mussels and mussels of the midwest, and will double as an art book for those who like nature art reminiscent of the 1800's.

New World Record Sizes

Do you think you have some really big shells in your collection? Is that new *Pleuroploca gigantea* you just found on your last collecting trip bigger than and you have ever seen before? Do those whopper Emerald Nerites you brought back top the *Compendium* size by a full millimeter? If so, there is a place to record them now, and there will again be records against which to check the sizes of your giants. A new book on record size shells will be published in July 1997 by Snail's Pace Productions. Editors are Kim Hutsell and Don Pisor. The projected cost will be \$15.00. To order your copy, write Kim Hutsell at 5804 Lauretta Street, San Diego, CA 92110 email khutsell@ix.netcom.com.

Submissions for future editions may be sent to Kim also. Give family, genus, species, and subspecies and form if applicable, the greatest obtainable measurement of the specimen to the tenth of a millimeter, the locality collected, the repository (where it is now), date collected if known, and reference to a publication where others may read about the species. All submissions must be verified by a "recognized authority," say Kim and Don, and you must include that person's name to help avoid misidentification and mismeasurements.

HAPPY BIRTHDAY
CONCH-NET!

COA's internet website, The Conchologist's Information Network, or Conch-Net, is one year old this month. In that short year, over 11,000 people have visited Conch-Net, browsed through its many documents, sent queries about shells, and/or joined COA.

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MARGARET CROCKETT TESKEY 1904 - 1997

by Stephen McMahan

On January 26th 1997, at the age of 92, Margaret Teskey, a beloved mother, grand mother, and friend to all who knew her, passed away. In her days she enriched the lives of everyone she met and left behind a life time of passion and diligence in the community of conchology. I'm sure I speak for all when I say she will be greatly missed. But as she passes on, her years of hard work and dedication will live forever.

Margaret was born April 8, 1904, in Napoleon, Ohio. She was a member of the Conchology Section of the Buffalo Museum of Science from 1944 to 1956 and served the last three years as Curator of Mollusks. Joining the AMU in 1946, she was Secretary and Treasurer from 1953 until 1958, then, when the office was split into two, she continued as Secretary until 1970. Margaret also was coeditor of the AMU publication, *How to Collect Shells* (3 editions). She was an honorary member of the Miami Malacological Society and the Chicago Shell Club, honorary life time member of the AMU, and honorary "Conch" of the City of Key West. She is also listed in "Who's Who Among American Women".

Margaret lived her life in much the same way as did her great grandmother, a "true pioneer," she describes in her memoirs:

My paternal great-grandmother died at age ninety nine, when I was three or four. I saw her but once. . . of a wizened figure in a rocking chair, amazing to a child in that she smoked a black pipe! I was later informed that she had been a tiny sweet-faced lady. . . and who baked the finest bread in Seneca County. . . a true pioneer, coming from Kentucky with her parents early in the nineteenth century to carve a homestead from the Ohio wilderness. I can only imagine the hardships that Catherine Brown (nee Pulaski) must have endured, yet I'll wager that she knew not that she was impoverished, underprivileged and a drudge.

Margaret referred to herself and other collector friends as "fellow creeps." To say she was a shell collector would be the understatement of the year. She collected miniatures with a passion along with Xenophoridae. In 1988, when she donated her entire collection to the Florida Museum of Natural History, she had collected an estimated 20,000 specimens. Her fascination with seashells went back to her childhood as she explains in her writings:

I remember seashells! . . . my father had . . . served in Cuba during the Spanish-American War. From there he had collected a few seashells . . . I especially remember two of them — the small, thimble-sized bleeding tooth which so fascinated me that I took it to school to display to my schoolmates, and the pink-lipped conch which, too large for the bookcase, was used as a door-stop. After my marriage to my Coast Guard husband, I accompanied him on a duty to Florida. How thrilled I was at my first sight of salt-water (I tasted it) and at finding upon the beach some of my old friends from the bookcase.

Decades later, widowed and forced to augment my meager pension, I noted that popular interest in shells was beginning to match my own, and that dealers were offering them in stores and by mail. Thereupon I began my own shell business, setting up an exchange and purchase arrangement with other dealers, and had a sales list printed which I circulated to all who replied to my advertisement. I offered my old friend the bleeding tooth for a quarter, the big door-stop conch (conk) for a dollar. By the way, this last has been placed upon the endangered species list, its' collection and sale forbidden. The meat makes a delicious chowder; evidently it has made too much.

Margaret has a monotypic genus of Ostreidae named after her; *Teskeyostrea weberi* (Olsson, 1951) is the rarest of the Western Atlantic species in that group, I'm told. She also has a species of the microshell group, *Vertigo*, named after her. Dr. Harry Lee remembers, "When I confronted her with that fact, she said, 'Apt moniker; bad teeth and big for the genus.'" In 1985 she moved to Oregon to be near her son John and joined the Oregon Society of Conchologists. Always spirited and energetic, she wrote numerous articles and poems for the newsletter and organized the start of a club library.

There is no doubt that wherever Margaret Teskey went there was change for the better. She had a genuine understanding of life. From her childhood recollections to her passionate involvement in the field of conchology she shows each of us what life has to offer if we follow our dreams.

"And so I set down this accounting of the way of life of an average rural family during my childhood, that those who come after me may realize that each generation accepts its own conditions as optimum. That is as it should be."

—Stephen McMahan

Foreground:
Margaret Teskey.
Behind her
from left: R.
Tucker Abbott,
Wayne Stephens,
Cecilia Abbott.
Portland Oregon,
August, 1990.



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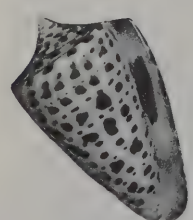
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THE MANY FACES OF *VEXILLUM (COSTELLARIA) SANGUISUGUM* (LINNAEUS, 1758)

by Bob Purtymun

The shell of *Vexillum sanguisugum* (Linnaeus, 1758) is very variable, both in color and in sculpture. I have collected this mollusk over a wide area of the Pacific Ocean, by random fanning, tracking or crawling on the sand at night (The shell, not me).

Entries from my dive log:

#12385 May 19, 1978. Collected in fine silty sand with scattered coral heads. 1/2 mile northwest of Mant Passage, Ponape Atoll. Tracking. 55 feet deep. 31.5mm long.

#09014 Sept. 3, 1976. Collected crawling on muddy sand in the borrow pit at Aua, on the north shore of Pago Pago Bay, Tutuila Island, American Samoa. At night, 15 feet deep. 37.2mm long. The coral taken from this pit left a man-made habitat for sand shells. It was used for the foundation of the torpedo shop built in 1942 for World War II. There are not many areas for sand shells on Tutuila Island.

#12192 May 8, 1978. Collected in fine, silty sand in the lagoon side of Arniel Island, Majuro Atoll, Marshall Islands. Random fanning. 60 feet deep. 33mm long.

#07976 May 21, 1988. dive #4. Collected crawling on silty sand on a dark, rainy night in Northwest Cove on Boyan Island, Palawan, Philippines. (10-35.25N Lat X 119-07.7S Long.) 45 feet deep. 42mm long.

#07345 Dec. 7, 1983. Dive #2. Fanned out of a fine sand pocket with scattered live and dead coral. On the lee side of Grubb Reef, Great Barrier Reef, off Townsville, Queensland, Australia. 80 feet deep. 42mm long.

#12873 Feb 14, 1986. Dive #2. Fanned out of fine, silty sand on a hard coral substrate. (18-41.4S Lat X 174-01.8W Long). Mala Island, Vava'u Group, Kingdom of Tonga. 10 feet deep. 35 mm long.

#07952 May 21, 1988. Dive #1. Fanned out of silty coral sand. Off Cooke's Point, Boyan Island, Palawan, Philippines. (10-27.4N Lat X 119-05.0E Long) 40 feet deep. 32mm long.

#05137 May 19, 1988. Dive #5. Large dead coral heads with clean coral sand channels. Crawling on the sand at night. Panganaken Point, Palawan, Philippines. (10-17.1N Lat X 118-56.3E Long) 45 feet deep. 33mm long.

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PAPUA NEW GUINEA — A LAND OF CONTRASTS

by "Henry A. Martens"

Papua New Guinea (PNG) is a land of scenic, biologic, and ethnic diversity. Comprising the eastern half of New Guinea, the second largest island in the world, PNG is geologically active with earthquakes and volcanoes. Elevations range from sea level to over 13,000 feet, with hot, humid lowlands and cool highlands. Biologically, PNG is more closely related to Australia than Southeast Asia. There is a great ethnic diversity: the native peoples speak over 700 different languages, a third of all the languages in the world! You can understand why it is a fascinating country to visit.

During my three-week trip to PNG, I visited, and found landshells at, four of the many biologic regions: the southern lowland rainforest at Port Moresby, the highland rain forests at Mts. Hagan and Tari, the steamy meanders of the Sepik River, and the hot north coast at Madang.

The Lowlands at Port Moresby

Our morning at Port Moresby was spent in the Variata National Park, a lowland coastal rain forest. We drove up the Launa Valley which is cut in thick layers of black agglomerate. The 200 foot Launa Fall was below us near the summit. We took the Circuit Track and saw the carnivorous plant *Nepenthes mirabilis* (but I outran it) and the plant *Banksia digitata*, one of the villains of Australian children's stories. I didn't realize *Banksia* came this far north — additional evidence for an Australian connection. Along the trail were two empty, very well preserved 35mm *Hemiplecta cairni* shells with their angled periphery.

The Highlands at Mount Hagan

We returned to Port Moresby and took a short flight to Mt. Hagan in the Highlands. The Haus Poromon Lodge was outside town at about 6,000'. We had to use a 4-wheel drive vehicle to climb the 1,000' to get there! Sleeping accommodations were round houses about 15-20' in diameter, with springy, thatched floors. The pleasant temperature at this elevation encouraged me to go for a little walk before and after dinner, but I didn't see any snails. Maybe they're too fast for me.

Got up early and had a nice view of the countryside. A nearby village was in fog! Walked into the canyon through the native forest. I met a local man along the trail and asked him about snails. He said, "I crushed a snail on the road and there was a snake inside." He invited me to visit his village but I didn't have time. Everyone is very friendly and wants to shake hands. I found no snails but saw a beautiful waterfall.

Sepik River Lowlands

In the morning we left via jeep to Mt. Hagan to board an 8 passenger charter plane for the Sepik River region in the middle of the Armbak territory. One of the world's largest rivers in terms of annual water flow, the 700 mile long Sepik River drains northwestern PNG and is navigable for almost its entire length. It is to PNG what the Congo is to Africa and the Amazon to South America. Flew northwest for an hour to a small dirt airstrip at Amboin and went by boat up the Karawari River, past several villages, to the Karawari Lodge. The lodge is 100' above the river which is at 60' above sea level. From my cottage I could look north across the Sepik flood plain to the volcanic islands off the north coast.

After lunch we went by boat to Kundaman. Ronald, our guide from the village, said the people wear western clothes normally but go native for visitors.

Melanoides rustica is tall and unsculptured.
Madang Prov. Nobonob Lookout.



Achatina fulica, originally from Africa, was introduced to the islands before W.W. II by the Japanese as a food source. Madang Prov. Balek Wildlife Sanctuary

The people at Kundaman had face and body makeup of white clay or lime. Most children were naked but some girls had colorful skirts. Entering a village, as a courtesy, you first looked at the items for sale. If something was of interest, you asked for a "first price" and then for a "second price." There usually was no "third price." The second price was 50 to 70% of the first price, but you always asked for the first price.

We received a friendly welcome and were instructed in the making of sago, from the tree to the plate. Sago is the staple food of the Sepik people. The long process and its final result is not very appetizing to western taste, nor is it very nutritional, being almost pure starch. But in a land too swampy to grow anything else, it is an extremely important food and there is no sago shortage since sago palms grow everywhere. Sago preparation is a joint men-women effort. The men cut down the palm, cut away the bark, and chip and pound out the pith, producing a fibrous sawdust. The women knead the pith and drain water through it to dissolve the starch. The starch-water is collected, usually in an old canoe, and the starch settles as an orange, glutinous mass. It is then dried and ready for use. The sago is sometimes mixed with water and fried into a rubbery pancake, or it is boiled into a gluey mush. It has a taste that has to be acquired! We spent about two hours there and then returned to the lodge by boat.

Up early the next morning for a bird walk. Took the boat down river to Mandam, where we walked through the village and then on a trail through the woods. Saw the Twelve-wired Bird of Paradise with its long bill, brown head and throat, yellow breast and twelve tail feathers, each 10" long. Arrived back at the lodge in time for breakfast.

An hour boat ride took us down the Karawari River to Mamjami village. The Tambaran (spirit) dance was very colorful, men and women in their straw headdresses, with their faces and bodies painted. After the dance came a reenactment of a female initiation ceremony. The women had colored markings painted on their backs. Normally, these marks were done as razor cuts to produce a pattern of tattooing. As we left the dance area I picked up two unionid valves from a shell discard pile in the village. I think they may use the shells as a lime source for pigments.

Back at the lodge I saw some 25mm empty flat-topped *Chloritis* shells near the boat dock, brown, with a reflexed lip. After dinner a local bamboo band performed: three guitars, 4 or 5 singers, and two men who hit the ends of horizontal bamboo sections with rubber sandals. Very interesting.

Rained like mad that night but stopped by morning. Left the lodge early and walked to the boat dock, finding a few more empty *Chloritis* shells. A man asked if I wanted some live snails. We walked along the river bank past the village and searched in a cultivated field of vines and corn. I didn't find any shells, but a boy

brought me a live 30mm *Naninia citrina* to photograph. It had a greenish shell and a single brown spiral band above the periphery.

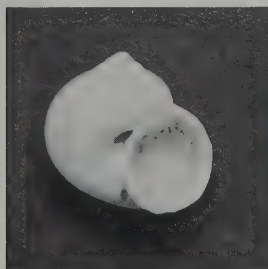
When the rest of the group arrived at the dock we took a boat down river to Mamjami village where the ship *Sepik Spirit* was waiting. In the village we saw a reenactment of part of the boy's initiation ritual. The entire initiation consists of a period of confinement (in the Spirit House), training, and education. The initiation culminates with a skin-cutting ceremony. During an hour ritual, the young man's arms, shoulders and upper body are cut. The cuts are about a half to 3 quarter of an inch long, quite deep, and arranged in swirling patterns. These cuts are now made with a razor blade instead of the traditional bamboo knife. The cuts are filled with clay and ashes to ensure they heal as raised scars resembling crocodile scales. The ceremony is fenced off from the rest of the village and drums and flutes play continuously. For our performance they used paint instead of the razor blade.

Boarded the ship in time for lunch. Each day all newly purchased items were sprayed before being taken to one's cabin. Graham, the captain, was Australian. The ship was 30,000 pounds (15 tons), 90' long and 30' wide, and it had a 3 foot draft. It carried 20 people in 10 large, comfortable cabins. The ship was decorated with beautiful wooden panels carved by a local artist. In case of emergency we were told, go to the upper deck — the river is shallow so the upper deck will be above water if the ship sinks.

The next day we went to the village of Kaminabit I. Visited a Women's House and saw artifacts and another demonstration of cooking sago. Walked about a mile on the coastal path to Kaminabit II where the men did a dance for us in a fenced enclosure. There were no women present. The men wore grass skirts, small headdresses and no face paint. The village had a small crocodile farm. Called *puk puk*, the crocodile still has great cultural and economic importance. Initiation rites involve scarring young men's skin to resemble crocodile scales, crocodile heads are carved on the prows of their dugout canoes, and the animals are an important cash crop. They can only sell skins from animals under 7'. The tail is edible, with a fish taste, though the rest is very sinewy. Because crocs won't bite under water, men catch them by feeling them in the mud with their feet. It must work because I didn't see any one-legged men.



Cyclotus is a ground dweller that can withdraw into the shell and block the aperture with the operculum. It is related to *Cyclophorus* but is smaller and has a lower spire. Madang Prov. Balek Wildlife Sanctuary



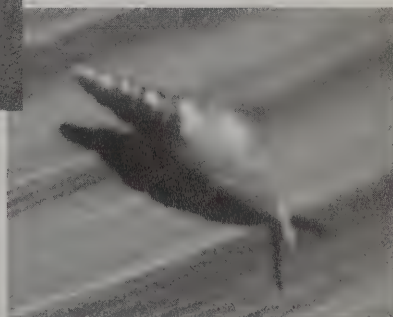
Leptopoma perlucidum lives on the leaves of shrubs. Madang Prov. Nobonob Lookout.



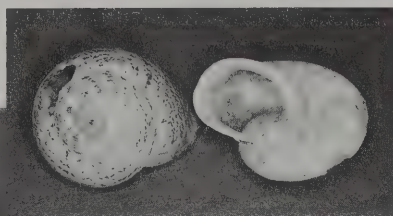
Hemiplecta cairni has a large shell with an angled periphery. Central Prov. Varirata National Peak.



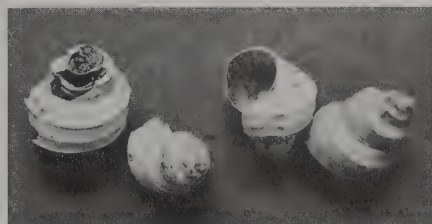
Rhyncotrochus strabo dampierensis has a single peripheral band. Below, it is purple and the aperture is outlined in white. Madang Prov. Nobonob Lookout.



The tropical tramp, *Lamellaxis gracilis*, is found near habitation East Sepik Prov. Kanganamam



Canefriula cynthia is a sister to *Rhyncotrochus tayloriana* but doesn't have the dark-outlined aperture. Madang Prov. Nobonob Lookout.



Melanoides tuberculata has spiral sculpture. East Sepik Prov. Kanganamam

On a night walk in Mamjami village, we saw many tree frogs and insects but no snails. Visited the house of our guide; 35' by 75'. It was 10' off the ground to keep it cooler.

Next day we visited three Sepik villages, traveling by jet boat. Palambei used to be on the river but the meander was cut off, so the village is a mile's walk inland. Bought two freshwater snail necklaces of *Melanoides* at the landing. The larger *Melanoides* species is *M. plicaria*. Saw some Physidae, a sinistral freshwater family, on the ground along the walk to the village. Also saw *Lamellaxis gracilis*, a "tropical tramp," introduced by man and found near human habitation throughout the tropics.

Tambarans are spirits; consequently, the Haus Tambarans is the Spirit House, the largest house in the village, where the spirits live or carved spirit images are kept. Built on carved piles, it can be 150' long with a 75' spire at each end. The Spirit House was very impressive with its art work and dim lighting. Though it is for men only, they allow women in as visitors. We could leave our shoes on but must remove our hats. I was not allowed to photograph the priest's chair! The old Spirit House was bombed in W.W. II and has been replaced by two new ones. We listened to a wooden drum concert — very different.

The jet boat stopped next at Yentchen. The Spirit House here was not as interesting as Palambei's. Did see some empty *Papuina* shells resembling the solid colored, single banded *Papuina juliae* from Mt. Hagan.

Our last stop for the day was Kanganamam. The recent high water line was evident on the supporting timbers of the Spirit House — about 6-8' above ground level, for six months! No

(Continued on page 28)

PAPUA NEW GUINEA (Continued from page 27)

wonder there are so few land dwelling snails. If you are not freshwater or arboreal, you drown. Saw *Lamellaxis gracilis* (it doesn't know it can't swim) and some freshwater shells, Physidae and the spiral ribbed *Melanoides tuberculata*.

Then we rode to meet the *Sepik Spirit* at Timbunke where we'll take our charter flight to Tari in the highlands.

Highlands at Tari

Left *Sepik Spirit* this morning. After breakfast walked through Timbunke to the grass airstrip and saw shells of *Chloritis* and the tropical tramp *Subulina octona*. It was hot already with some scattered clouds.

Flew south to Amboin for gas and then circuted the major peaks (13,000' +) to Tari — an hour flight over some very rugged, forested terrain. Glad we didn't have to stop for directions. Across from the airport at Tari was a local market swarming with people, men with beards, face paint, outlandish hairdos. One man, in native dress, playing a bamboo flute, was wearing gold-rimmed sunglasses! I have never seen such bizarre costumes or faces in my life.

From Tari at 5,000' to Ambua Lodge at 7,200' was 45 minutes by van. The lodge, with a commanding view of the Tari Valley, was in the highland rain forest. Consequently it was raining when we arrived.

After lunch we took a walk in the rain forest across two suspension bridges to a beautiful waterfall. The damp, mossy trail had many ferns and orchids. Before sunset we rode to The Gap at 9,000' and saw several beautiful orchids and the King of Saxony Bird of Paradise with its spectacular 16" head plumes.

Today is an all day excursion to three Huli sites. Huli are one of the local highland tribes. There was a clan war going on, and yesterday three men were killed. As we approached Tari about 150 armed men, in native costume and all painted up, came marching toward us in two lines, carrying bows, arrows, machetes, spears and homemade rifles. We stopped and they waved as they walked by. One man made faces and waved his arms to show how fierce he was, but allowed us to take his picture! Our driver must have belonged to the correct clan because they didn't bother us. He said we were safe because we were not involved — prize fighters don't attack people in the audience (most of the time) either. Huli culture has a strict payback policy — eye for eye. The homes we passed had a surrounding trench and wall and an entrance through a wooden fence with a very small opening into a sallyport, then another gate before you were inside.

Our first stop was the Kara Wig School. The Huli men wear wigs made from human hair, which is grown at the Wigman school. Men must be single and stay for 1.5 years. Their heads are sprinkled with water several times a day to make the hair grow. They sleep on their backs with a neckrest to avoid crushing the hair. After 18 months, when the hair is about a foot and a half long, it is cut at the scalp and tied together to make a wig resembling a Napoleonic hat. The day wig sold for 200 Kina



Two subspecies of *Rhyncotrochus taylorsiana* show the variation of this colorful species. They show less variation in the ventral view. Madang Prov. Balek Wildlife Sanctuary.



Chloritis fruhstorferi has a dark shell and dark body and short, stiff hairs that feel like velvet. It has not been reported from PNG. Madang Prov. Kau Wildlife Area.

(\$140) and the ceremonial wig for 400 Kina (\$280). Letting your hair grow sounded like a pretty stress-free job, but they wouldn't take an old bald-headed man.

A short distance beyond Kara, at Alungi, we witnessed a singing — really spectacular! Men in costumes of feathers performed a very colorful combination of singing and jumping. All the species of Birds of Paradise were represented by feathers in the headdresses. It looked like something from National Geographic, or a page from a bird watcher's wish list.

After a picnic lunch we visited Pajai, the medicine man or witch doctor who told us about local remedies and then showed us the skulls of his mother and father, just as we would keep and show photos of our parents. I always thought the skulls in their villages were enemies they had eaten; instead they were their "family tree." He also showed us "meteorites" used in witchcraft. They were round and heavy and not pitted like meteorites, and looked like old cannon balls to me.

North Coast at Madang

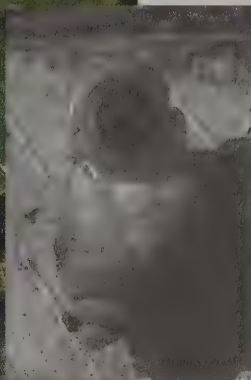
This morning we drove to Tari. I photographed snails in the airport waiting area's vegetable garden — an unusual feature! We



Cyclophorus kubaryi is an operculate. Manang Prov. Nobonob Lookout.



Pupinella, another operculate, has a pupinoid shell and a notch at the base of the outer lip. Madang Prov. Balek Wildlife Sanctuary.



The spirit Dance has color and music. East Sepik Prov. Mamjami.

barely made our connecting flight at Port Moresby, arrived at Madang, and drove a short way to Jais Aben Resort, on the Madang Lagoon of the Bismarck Sea. We had individual bungalows with a screened porch overlooking the sea. Saw an empty *Achatina fulica* shell in the lawn rakings.

Had thunder and lightning most of the night, and a really hot, muggy morning. After breakfast our group walked to the Christensen Research Institute (CRI). The Director told us Mr. Christensen was interested in art and frequently visited the Sepik and Madang areas. He became a partner for a time in the Jais Aben Resort and established a scientific research center on the resort property. CRI didn't have much information about landsnails.

Before lunch we drove up the coast, then canoed a short way to Tadwai Island. Mostly coral sand, the small, 50 by 250 yard island has a maximum elevation of a foot or two. Many empty *Pythia scarabaeus* shells were on the ground, and on the windward side of the island I saw many live specimens, only on pandanus leaves.

Back to the lodge for lunch and then a motor boat to Tabat (Pig) Island in the mouth of Madang Lagoon. It's a mile long and 100 - 150 yards wide. I had only 45 minutes so I walked to the windward side — a repeat of the *Pythia scarabaeus* on the pandanus. Mangrove trees were also present, but I could find no snails on them in this hot, dripping place.

Next day I inquired at CRI if anyone was going to visit the Kau Wildlife Area managed by CRI. There was a group leaving at 8:30 and returning about 2:30. I got my camera bag and joined them. At the Area, 20 minutes from CRI, a museum is under construction, with a great view of Madang.

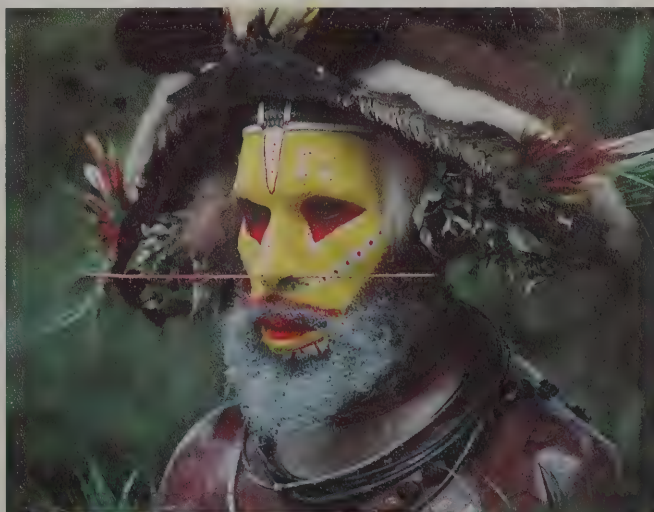
My guide, Mika, was about 18 and spoke some English. We saw *Achatina fulica* near the parking lot. The terrain was open virgin forest, in contrast to the rain forests we had been seeing. Along the trail I photographed some *Cyclophorus kubaryi*, *Rhyncotrochus tayloriana*, *Canefriula cynthia* and *Chloritis fruhstorferi*, which is covered with short, projecting hairs. At the Kau River we saw the freshwater snails *Neritina sulcosa* and *Melanoides rustica*. We waded the river and went up a vertical cliff to the top of the ridge. I lost my confidence in Mika when we came to a fork in the trail and he asked me which way I wanted to go! We started walking at 9:30 and quit at 1:45. I think he was trying to kill off the old man. I saw and photographed about ten species — the best snail day of the trip, so far.

At the CRI library I found the preliminary report of Andrzej Wiktor, a Polish malacologist who was at CRI for 3 months in

(Continued on page 30)



Naninia citrina is colorful. East Sepik Prov. Karawari Lodge.



The Huli are unique. Southern Highlands Prov. Alungi.

PAPUA NEW GUINEA (Continued from page 29)

1990. He noted that empty shells decompose in less than a year. Consequently, the only shells seen are those from the current year.

Today I made arrangements with Charlie, manager at Jais Aben, to go to the Balek Wildlife Sanctuary, a small area from the highway footage back to steep, forested limestone hills. We walked about a hundred yards from the road to a beautiful shaded pool and spring — a scene from a Tarzan movie. The spring is slightly sulphurous and came out of the limestone.

The ground surface from the road to the spring was literally covered with *Achatina fulica*, not thin shells but thick solid ones. On both sides of the spring, the damp soil had *Pupinella* (dead and live), *Cyclotis* (dead and live), *Lamellaxis gracilis*, *Chloritis fruhstorferi*, *Helicina*, and *Canefriula cynthia* and *Rhynchotrochus tayloriana*. Looked for live "Papuina" in the foliage and on the trees, but didn't see any. "Papuina" lives in the crown of the trees and this accounts for rarely seeing live specimens. I have never photographed such nice material in such a beautiful setting.

The next day we drove toward Madang. Turned south and went until the road was unpaved, then on a dirt road to Ohu village in the Alderbert Range where a local man had a private butterfly farm. Butterflies were raised for export as decorations or mounted in wall plaques. We visited the enclosed rearing area and then the collecting site. He said, "Common butterflies feed on common plants and rare butterflies feed on rare plants." On the bush walk, saw birdwing spiders and their webs between trees in the butterfly flyway. Also a few snails, *Lamellaxis gracilis*, *Achatina fulica* and *Chloritis fruhstorferi*.

After lunch at Jais Aben, walked to nearby village of Riwo. It was a village in cultural transition: traditional buildings next to abandoned automobiles.

At dinner it began to pour and continued most of the night, but was not raining next morning. I met my guide to Nobonob Lookout at 9:00. The Lookout was used as an observation post by the Japanese during WW II. We then walked through planted areas to the base of the Nobonob Hills. Up and down through second growth forest and small planted or formerly planted areas, we waded streams very muddy from the rains last night. Saw live *Cyclophorus kubaryi* and *Neritina sulcosa* and dead *Canefriula cynthia*, *Rhynchotrochus strabo dampierensis*, *Chloritis fruhstorferi*, the tall freshwater *Melanoides rustica*, *Achatina fulica* and the helicoid operculate, *Leptopoma perlucidum*. The last is called Translucent *Leptopoma* because of the appearance of the empty shell. When alive the shell appears green because the animal's green body shines through. The green body is thought to be due to the chlorophyll it eats.

After lunch went to Madang City and stopped at Smugglers Cove Lodge to see the artifact workshop, visited the post office, local museum and then the Madang Resort Hotel. Later we visited the 30 meter high WW II Coastwatcher's Memorial. It is visible 25 km at sea and is a reminder of the men who remained in Japanese occupied territory to report on Japanese troop and ship movements. I remembered the coastwatchers from "South Pacific."

Next day we flew from Madang to Port Moresby via Mt. Hagan, and then on to Cairns, Australia. Papua New Guinea was a unique experience. The geological, biological and cultural diversity is found in few places in the world. I suggest you visit PNG before more changes occur.



Group of Wigmen letting their hair grow. Southern Highlands Prov., Kara.

The pool at Balek. Madang Prov.



Pythia scarabaeus was seen live only on pandanus leaves and has barriers in the aperture. Madang Prov. Tadvai Island.



Melanoides plicata is the large freshwater shell in the necklace. East Sepik Prov. Palambei

Many cowry shells adorning a mask. East Sepik Prov. Kamanibit Women's House.



OUR BRAZILIAN CONNECTION:

Achatina fulica (Bowdich, 1822): A New Old Problem.

by Jose Coltro

Many Florida residents remember the problem with *Achatina fulica* when it was introduced in this state. As an agricultural pest in Florida, the shell was eradicated (see Abbott, 1989, *Compendium of Landshells*, pg.78) in 1972. I have found specimens in Hawaii and American Samoa and I have received specimens from Philippines, Sri Lanka, Tahiti, etc. In Tutuila, American Samoa, I found only this species and none of the local species (*Partula* sp.). It seems that the *Achatina* destroy the native species not by preying upon them, but by competing for food. In some of those places the local authorities have introduced a very dangerous predator: *Euglandina rosea* (Ferussac, 1821), a Southeast U.S. species. As a very carnivorous species, it attacks not just the *Achatina*, but all the other species as well. Many species on the Pacific islands are endangered species: the *Euglandina* eats all of them.

In 1990 some members of our shell club, Conchiliologistas do Brasil, saw some live specimens of *Achatina*. These snails were part of an agricultural exhibition in a display about "escargot," *Helix aspersa* Muller, 1774 - the commonest species used in French cuisine. The man who created the display told them that the shells were only for exhibition, not to sell. But a few weeks later we saw news in an agricultural magazine of this man showing his "escargot" farm with many *Achatina*s. We decided to send a letter to our governmental wildlife institution (Ibama) with many articles about the dangerous situation of introduction of this species here in Brasil. We never received a single answer.

Some months ago a small town at the Sao Paulo State, called Miracatu, had to ask for help to try to control an agricultural pest.

A giant snail was destroying most of the crops around the town, eating large areas of lettuce, beans, corn, etc. Recently news reached us about another problem in one of our most popular beaches, Praia Grande: a giant snail invading houses. Guess which shell was the culprit in both situation? *Achatina fulica*, of course! In another four states, Rio de Janeiro, Minas Gerais, Parana and Santa Catarina, specimens are found in quantity.

Achatina fulica has no natural predator in Brasil and the shell competes with some local species, especially with the *Megalobulimus* group. Miracatu is on the border of our most important Atlantic tropical rain forest park, where it is possible to find over 25 different described species of Megalobulimidae and Strophocheilidae and many other new species. The reproduction of *Megalobulimus* isn't like the *Achatina*, and they will probably become extinct in many areas before the Government starts to control this pest.

Members of our club are trying to meet with people from our Government to alert them about the problem. It will be very hard to try to exterminate or even to control the *Achatina* population. The tropical forest is very dense and in many parts it is impossible to walk through. Most of our country is really mountainous and rugged terrain doesn't help any efforts to control this species. It will always be possible for some populations to exist, hidden in valleys in the forest, which can then spread out again. And yet the "escargot" people still breed this species. Without a law to banish the culture of this species from our country, we could have always accidental introductions and the problem will be here forever.

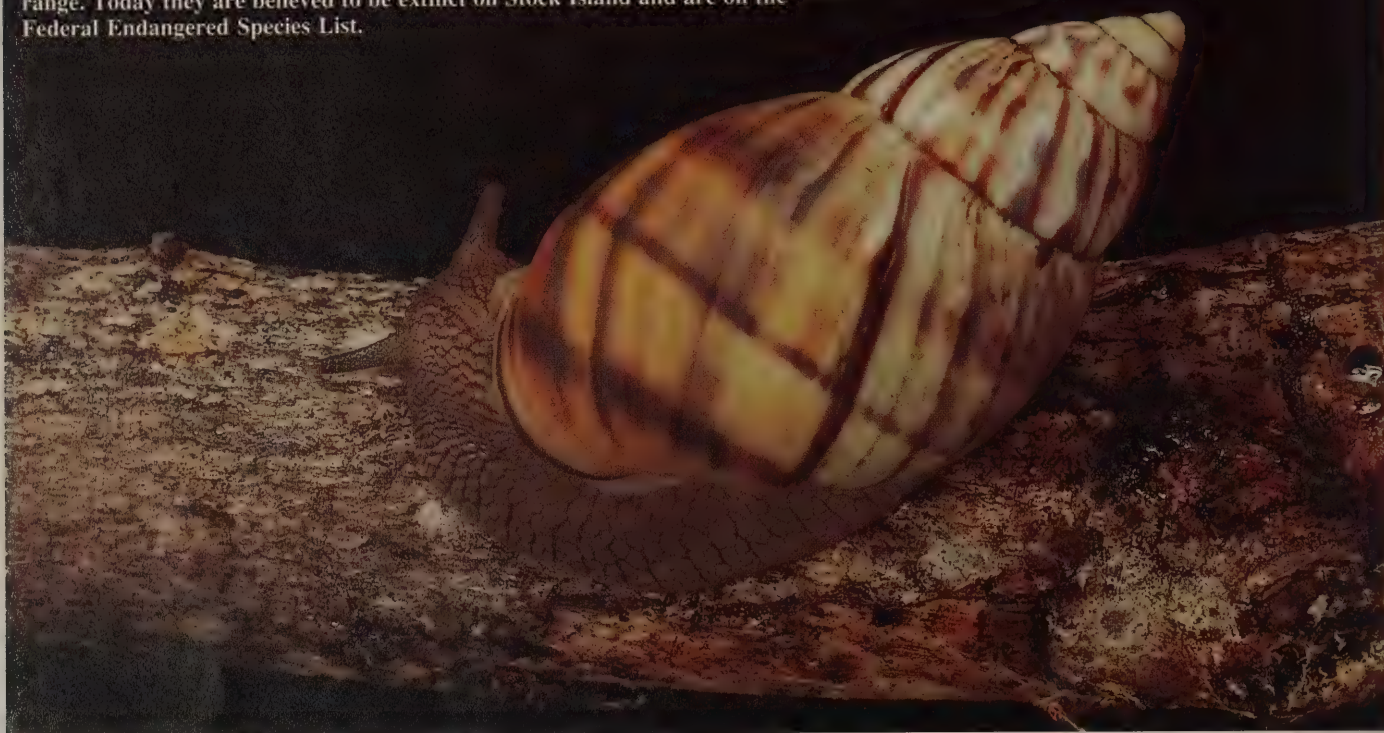
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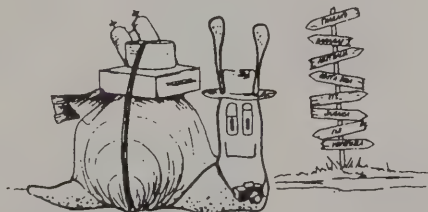
The Internet and the Worldwide Web are rapidly becoming the place for shellers to be. The following U.S shell clubs now have websites and more may be on line by the time you read this:

- Astronaut Trail - <http://pw1.netcom.com/~ejpower/atsc.html> (created and maintained by Emilio Power).
- Central Florida <http://www.magicnet.net/~lkoestel/cfsc.html> (created and maintained by Linda Koestel).
- Conchological Club of Southern California - <http://www.lam.mus.ca.us/~ccsc/>
- Englewood (FL) <http://www.flnet.com/~crosby/shell> (created and maintained by Freeman Crosby).
- Georgia - <http://museum.nhm.uga.edu/GSC/gashell.htm> (created and maintained by Steve Hilliard).
- Guam - <http://www.geocities.com/Yosemite/6032/> (created and maintained by Jeff Young).
- Hawaiian Malacological Society and HSN <http://www.hits.net/~hsn> (Webmaster Tom Burch).
- Indianapolis, <http://www.oaktree.net/makuabob/INDYSHEL.htm> created and maintained by Bob Dayle.
- Marco Island - <http://www.naples.net/clubs/shell.htm>
- Naples - <http://www.naples.net/clubs/nplshell.htm>
- North Alabama <http://fly.hiwaay.net/~dwillis/nasc.html> (created and maintained by Deborah Wills)
- North Texas - <http://home.earthlink.net/~jcaldeira/ntcs.html> (created and maintained by John Caldeira).
- St Petersburg <http://www.clearview.pinellas.k12.fl.us/SPSC.HTM>
- San Diego <http://www.molluscs.net/SanDiegoShellClub/index.html> (created by Bret Raines and Kim Hutsell and maintained by Bret Raines).
- On the international scene, Gruppo Ricerche e Studi Malacologici of Livorno, Italy <http://www.difi.unipi.it/~campani/Gml.html> (created and maintained by E. Campani).
- In Australia, Patty Jansen created a website for Townsville Shell Club at <http://www.ozemail.com.au/~filejest/tsc.htm>
- The Conchological Society of Southern Africa has a website at <http://www.molluscs.net/ConchSocSoAfrica.html> (maintained by Bret Raines).
- In addition, WSM has a webpage (created and maintained by Tom Arnold) at <http://www.users.cts.com/crash/t/arnold/WSMPage.html>
- And AMU has a new website created and maintained by Deborah Wills, who is also Webmaster of the COA site, Conch-Net. It's at <http://erato.acnatsci.org/amu/>

Orthalicus reses reses Say, is a lower Florida Keys resident from a predominantly tropical American family of land snails, the Bulimulidae. *O. r. resus* is more susceptible to cold than even the *Liguus* species, which are also bulimulids; *Orthalicus* have a more southerly range in Florida than the *Liguus*. In 1986 Kevan Sunderland took this picture on the Stock Island Golf, then a part of their historic range. Today they are believed to be extinct on Stock Island and are on the Federal Endangered Species List.



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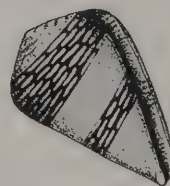
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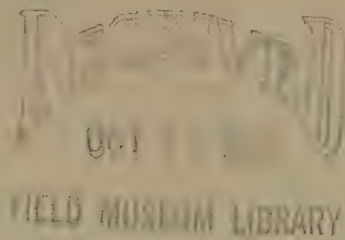
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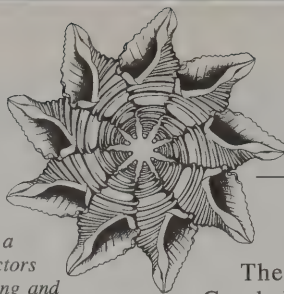
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CONCHOLOGISTS



OF AMERICA, INC.

VOL. 25, NO. 3, SEPTEMBER 1997

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors - the beauty of shells, their scientific aspects and the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a resolution concerning the conservation of mollusks: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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MEMBERSHIP

Memberships are for the calendar year, January-December, late memberships retroactive to January. **1997 DUES:** (USA, Canada, Mexico) \$20.00; Postal surcharge: \$10.00 for other Western Hemisphere nations; \$12.00 for Europe; \$15.00 for Asia, Africa and the Pacific Rim. Please pay in U.S. dollars, or on check with Transit Enrouting and Account Numbers printed at the bottom, or with money order; make checks payable to CONCHOLOGISTS OF AMERICA. NEW MEMBERS apply to Lucille Green, MEMBERSHIP DIRECTOR. RENEWALS go to TREASURER, Bobbie Houchin. BACK ISSUES are available from PROPERTIES DIRECTOR Hank Foglino, 4 Trent Court, Smithtown, NY 11787-1266. Prior to 1985 \$3.00 each; 1985 to current \$5.00 each.

PRESIDENT'S MESSAGE

The 25th Silver Anniversary Convention of the Conchologists of America is now in the history books. From start to finish it was a great convention. Everyone seemed to have an outstanding trip to Captiva Island.

Several points of interest to COA members came out at the convention. As many of you are aware, we had a difficult experience with the United States Postal Service back in March. Convention registration forms were extremely late getting to the membership, which in turn caused the registration committee and Anne Joffe a tremendous headache. To help alleviate this situation in the future, the COA Board of Directors approved an option to mail the American Conchologist First Class instead of Bulk Mail. Available to COA members who wish to pay an additional \$5.00 postage. The new 1998 membership renewal envelopes, included in this issue, offers this option.

The results of the Convention Survey, conducted last year at the banquet in St. Petersburg Beach and again in the September issue of *American Conchologist*, were presented at the Annual COA Business Meeting at Captiva. It was the decision of the Board that a second, more comprehensive COA survey be done to determine the opinions of the membership concerning the total operation of COA, not just the convention. A committee has been appointed and a new survey will be mailed to all COA members sometime in 1998. You are strongly encouraged to participate and give the Board your feedback.

This year's meeting was the largest gathering of COA members in history, with over 400 in attendance at South Seas Plantation. COA continues to grow and attract new members. Our presence on the Internet has made a very significant impact upon membership, as has our outstanding quarterly publication, the *American Conchologist*. At the Annual COA Business Meeting at Captiva, the editor of the *American Conchologist*, Lynn Scheu, was given special recognition and appreciation for over a decade of service to COA. Thanks, Lynn, for all you have done over the years.

In 1998, COA will meet at the Royal Plaza Hotel at Walt Disney World in Orlando, Florida. Once again, COA members will have a very unique opportunity to attend the annual convention, but they will also have the advantage of attending all the attractions at Walt Disney World and surrounding attractions in the Orlando area. This will be a family convention, so bring your children, grand-children, or someone else's children. Disney World is for children of all ages. Mark your calendar and start planning to attend "Discover the Magic - COA - Orlando 1998".

A very special "Thank you" to all our members who attended the 25th Silver Anniversary Convention and to all those members of the Sanibel/Captiva Shell Club who worked so long and hard to bring this truly outstanding convention to us. A special "Thank you" to Convention Chairman Anne Joffe for leading this effort. It was perfect.

DAVE GREEN

COVER: Our cover artist, Sharon Snyder, (2015 Vivada Street, Orlando, FL 32803-3435) has illustrated a bold and colorful specimen of *Rapana venosa* (Valenciennes, 1846). A member of the family Muricidae, this predatory snail belongs to the subfamily Thaidinae (more recently Rapaninae) and grows to 4" or more. *R. venosa* is known from Japan and China, where it is a common subtidal predator. It has also been introduced to the Black Sea.

R. WAYNE STEVENS

1911 to 1997

COA President 1980-1981

On June 21, 1997 Wayne Stevens passed away after a short illness. He has gone from our sight but never from our hearts. Please join with me now in honoring this fine man who in 85 years of his life made many genuine friends in and out of the field of conchology.

Wayne was born in Portland Oregon on September 13th, 1911. At 23 he was elected President of the Young Democrats League of Oregon. He married his wife Marjorie in 1936 and a year later attended Northwest Law School while being active in Toastmasters. In the early 1940's Wayne trained State and Military Police in the art of Combat Jujitsu as well as writing and publishing a book on the subject. In 1951 Wayne, by now a legal bibliographer, started his own business, R. Wayne Stevens Law Books. He was a front runner in designing and supplying law libraries for the States of Oregon, Hawaii, and Alaska. He was elected Honorary Member of the Alaska State Bar Association. In 1980 he was elected President of the COA. After Wayne retired he and Marjorie spent much of their time in Hawaii as well as at their cabin on the Oregon Coast. Wayne and Marjorie have two children, six grandchildren, and two great grandchildren.

I attended Wayne's funeral service, witnessing first hand the love that was shared for him. The family chose a very appropriate song that I think best described this man, Frank Sinatra's "I Did It My Way." In his eulogy, close friend Henry Bauer described Wayne as "opinionated." Wayne took great pride in his arguments. When he had a dispute with the town of Rockaway on the Oregon Coast about a property line he went to City Hall and took them on. Learning building codes and arguing with every clerk in the building he finally won the right to build an addition to his house.

Having experience as a mason, architect, electrician, plumber, landscaper, and carpenter, Wayne was never short on projects. One in particular was a huge whale he carved

from a piece of driftwood in front of his home in Rockaway. If ever one needed an example of determination this would be it. Over two years and several power saws later the battle was over and as usual Wayne won again. The whale remains today, right where the war was waged, as a solemn reminder, "Don't mess with Wayne."

In his life Wayne inspired people to strive for higher. Rich Goldberg relates:

Wayne was significant in my becoming active in COA. I first met him at the 6th COA convention held on Long Island, New York, in 1977. At the time I was editor of the *Long Island Shell Club News*. Kirk Anders had mentioned to Wayne and others that I seemed to be a good candidate for taking over the editorship of the *COA Bulletin*. At that time, Tom Rice was acting as interim editor while still publishing regular issues of *Of Sea & Shore*. It was Wayne who sat down with me and convinced me that this was something I should do. It was also Wayne who got me involved in other board and committee positions during the early years of COA. The first task he asked me to take on was to solicit shell books from publishers for convention door prizes, a pet project of Wayne's which he initiated. Over the next 8 years I volunteered in various capacities, eventually becoming President in 1986. Wayne was the catalyst. I served as a committee member on Wayne's board when he was President, and worked directly with him and Mary Lerner to bring Charlie Glass in as the new editor of the *COA Bulletin*. Wayne was a major force shaping COA in the early years of the organization. His commanding presence at conventions will be missed by all that knew him.

I remember Wayne from our monthly meetings of the Oregon Society of Conchologists. When he entered, instantly the room filled with laughter. He always had a story to tell, usually about his latest trip to Hawaii (he would always correct your pronunciation by saying "Havahee"). Tom Hale, a friend of many years, recalls phoning whenever Wayne returned from Hawaii, and asking him, "How many?" Wayne would always respond, "How many what?" This referred to the number of *Cypraea* he and Marjorie had collected. Tom and Wayne playfully argued about a wide variety of subjects and always ended them with laughter and a hand shake. At our meetings Wayne was always approachable and friendly. He loved to stand firm on his opinion but he would never put you down for yours. I speak for the whole club when I say he will be dearly missed.

In his life his path crossed our paths. To each of us he left something special. With some it was a deep friendship; to others, inspiration and encouragement. As for me I'll always remember Wayne as a man who could light up a room just by entering and who could draw us together and make us all feel at home.

—Stephen McMahan



COA Past President Wayne Stevens, with
Ruth Greenberg, COA President 1981-1982.
Photo: Richard Goldberg

ELBOW CAY TREASURES

by Ann Buddenhagen

Back in February, Karlynn Morgan and I were trying to decide where to escape to in May for a week or so of shelling. Karlynn picked Elbow Cay in the Abacos, having been there once before, though not for shelling purposes. Kevan and Linda Sunderland, Sandy Melvin, Vicky Wall, Mark Johnson, and Nancy Gale also joined us for the trip. Karlynn agreed to handle all the reservations. The next thing I knew, Karlynn's travel agent was on the phone telling me she needed a check for room and boat reservations. BOAT RESERVATIONS? The only thing I knew about boats was that I knew absolutely nothing about boats. Ah, well, adventure calls!

We flew to Marsh Harbor in the Abacos. After a twenty minute ferry ride, we arrived in Hopetown on Elbow Cay. I saw now why we needed to rent a boat. Hopetown is literally built around a harbor. On Elbow Cay, if you want to go to the grocery store, or the post office, or the dive shop, or even next door to visit the neighbors in some cases, you have to have a boat. No roads in sight!

Day 1 — After breakfast we met our transportation for the trip — a 21-foot Scandia with a special-built canopy. All eight of us, plus all our snorkeling and shelling gear, fit comfortably in this small boat. We cast off and the adventure began. Kevan, Linda and Karlynn did all the driving (steering? handling?) and we all sort of shared the navigating. The first thing I learned was that landmarks on a nautical chart are very deceptive — they are much closer in reality than they appear on the chart.

We stopped first at a little islet that didn't even have a name on the charts. We anchored about fifty yards from shore in just over eight feet of water. The bottom was hard substrate scattered with small coral heads. It progressed to rocks and dead coral slabs closer to shore. And what treasure was under those rocks! Karlynn, Mark and I all found live *Conus abbotti*, and Kevan found a mass of *abbotti* eggs. Several small and immature *Charonia variegata* were also uncovered, but we left them until another trip when they would be larger. A live *Mitra barbadensis* and *Marginella guttata* completed my haul.

Sandy was very pleased with her large and spectacular *Strombus gigas*. She was eager to come on this trip because it

804 Westwood Drive, Raleigh, NC 27607

4. *Alcithoe*



Peek-a-boo with an immature *Strombus gigas*

was the first place she had visited where it was legal to take Queen Conchs. When Mark spied her catch, he launched into what was to become the catch phrase of the trip. Adopting a fake, Massachusetts-Kennedy-like accent, he intoned: "Oh, conch (pronouncing the ch on the end softly as in church), you can eat (word accent here, on a rising tone) those things, ya know! For the rest of the day he repeated this phrase whenever he saw a conch. By the end of the trip, we were all doing it.

At the next little islet, again no name, three small *Conus abbotti* were found. The unusual thing about these shells was that they were all red. Kevan and Mark were definitely green with envy. But I was envious of the live *Cypraea zebra* and huge, beautiful—and beautifully clean—*Charonia variegata* that Mark found inside a rusting oil barrel about fifteen feet down.

We moved on south to Little Harbor off Great Abaco Island. Kevan thought this would be a good place to look for *Cymatium femorale* and *Xenophora conchyliophora*. He encouraged us to work in teams of two, scouting the grass for tritons. This plan lasted for all of two minutes before everyone split up and went his own way. Perhaps that's why no tritons or carriers were found here.

I was amazed at the number of beautiful and fully mature *Strombus gigas* in the area. Apparently hungry natives hadn't yet located this haven. We also found plenty of large *Strombus costatus*, but they were very old with grey and cracked lips. I found one *Chicoreus pomum*, one *Turbinella angulata*, and one very large barracuda. I know they are not usually aggressive, but when they are bigger than I am, I become very cautious. A sudden and intense rain squall hit just as we returned to the boat. We did not enjoy the wet, chilly, and bumpy ride back to Elbow Cay, but we couldn't complain about the shells.

Day 2 — THE DAY OF THE TRITONS!

Someone had recommended Tahiti Beach on the southern end of Elbow Cay to us as a good shelling spot. It is a lovely stretch of clean white sand with a sickle-shaped sandbar jutting out from shore. Tilloo Cut is the name given to the juncture of the Sea of Abaco and the Atlantic Ocean just off Tahiti Beach. On the Abaco side



Murex pomum egg mass



My favorite *Cyphoma gibbosum* picture

of Tahiti Beach, the underwater terrain is mostly moderate turtle grass on hard bottom. Lots of sea biscuits and urchins, and a few sea cucumbers as well. For the first time, I got up the nerve to pick one up, expecting it to eviscerate all over me. Instead, I found a live *Melanella hypsela* — my first. There were also dead pairs of *Tellina listeri* on the grass, and live *Pinna carnea* buried in the sand.

Near a large limestone outcropping the grass became sparse and I found large colonies of hermit crabs milling around, mostly in cerith shells. I watched one colony for awhile, hoping to see a mass exchange of shells, but no such luck.

At the point where the Sea of Abaco meets the Atlantic, there is a sharp line of delineation between the turtle grass on the Abaco side and hard bottom supporting a typical reef environment on the Atlantic side. I crossed into the Atlantic and immediately noticed a strong current pulling me into the ocean and much heavier wave action. But the fully mature *Charonia variegata* I found live resting in the crevice between the grass and the hard bottom made me forget the current. I have found Triton Trumpets before in the Florida Keys, but only immature ones. I studied my prize for a minute or two before I realized how far away from the group I was being carried by the current.

It was a long, hard haul back to the calmer waters of the Sea of Abaco. I followed Karlynn along the ironshore on the Abaco side, where she found a dead sea fan with seven or eight live *Cyphoma gibbosum* and one *Siminia acicularis*. She liberated this last shell before I could get a picture, however.

Everyone else was back at the boat, so we headed in as well. On the way we collected *Natica livida* making trails in the sand, *Smaragdia viridis*, *Natica canrena*, *Americardia media*, and *Trachycardium egmontianum*. Mark, who had been braving the

wave action and current on the Atlantic side of the same ironshore, brought back large *Cittarium pica* shells for everyone, all with two or three limpets attached.

We moved south to the upper part of Tilloo Cay. We stopped at a place called "The Castle," for a large, turret-shaped building on shore. Again, the bottom was mostly medium-heavy turtle grass. At the edge of a small islet just off from the main island, where the limestone was worn down and full of crevices, we found the usual nerites (*peloronta*, *versicolor*, and *tessellata*), chitons, periwinkles, etc. at or just below the tideline. We shelled the hermit crab colonies in the crevices and found gold — seven dead but perfect *Murex macgintyi*. Other special finds included *Tricolia thalassicola*, *Rissoina cancellata*, *Polinices lacteus*, *Isognomon radiatus*, *Ischadium recurvum*, *Cymatium moritinctum caribbaeum*, *Hiattella arctica*, *Mitra barbadensis*, and *Muricopsis oxytatus*.

On the outside of the island we found evidence of the beginnings of a reef — 2 tiny (4" at the most) sea fans with *Coralliophila caribaea* in the holdfasts — one with a *Siminia acicularis*, now sans — a few small coral heads, and one soft coral so loaded down with *Cyphoma gibbosum* it was hard to see any of the coral.

We moved further south to Tilloo Bank at the extreme southern tip of Tilloo Cay. Approaching Tilloo Bank, we could see that underwater was largely a shallow (2-5') expanse of sand from Tilloo Cay on the left extending west about 1.5 nautical miles to the navigable channel. A strip of light-to-medium turtle grass just below the tideline extended about 30' and was littered with sea urchins — I counted at least 5 species.

I began cruising just below the water line, picking up mostly pairs of dead *Codakia orbicularis* and *Linga pensylvanica*. I saw

(Continued on page 6)

17. *Cymbiolacca*



Pinna carnea anchored in sand

ELBOW CAY TREASURES (Continued from page 3)

something pink in the sand — a fresh-dead *Trivia quadripunctata*. Now where were any rocks or coral heads near-by? I came across a very juvenile *Strombus gigas* almost completely buried in the sand. Pulling him out I found he was live! I sent him on his way, telling him to go forth and multiply, then found another, also buried. There were literally dozens of them, all about 3-4" in length, their heavy spines already well-formed, and all alive. I had stumbled across a hatchery. I was pleased to see them. Perhaps they are making a comeback.

I headed out into the boat channel and came across an area of the most lovely clean, white sand, very thick and almost spongy in texture. I swam over a ridge with dozens of *Terebra hastata* sand trails running down it. I collected a few and stopped to survey the terrain.

The sand was covered with a blanket of giant Bahamian sea stars every few feet. I swooped in on a 4" *Tellina radiata* (yellow form), and was admiring it and wondering how to carry it back to the boat when I began to see both color forms of *T. radiata* almost everywhere I looked. I have collected them before, but never in such profusion. More *Terebra* trails appeared, as well as some by *Polinices lacteus* and *Olivella floralia*. Suddenly I was up and down, up and down, collecting off the 5' bottom, grabbing a breath, and back down again.

Just when I thought I couldn't fit another shell into my collecting bottle, I came across a *Calliostoma pulchrum* on a stalk of green algae. I popped it in the special container I carry for miniature shells. As I looked up I spotted 2 dark, fuzzy somethings crawling across the sand. Live *Cymatium vespacium*! I managed to find room in the bottle.

I returned to the boat for new collecting bottles and met Karlynn. She had found 3 *Chicoreus pomum*, a *Turbinella angulata*, and a *Xenophora conchyliophora*, all while on her way back to the boat for a break. Back in the water, I headed back to the turtle grass and sea urchin beds close to shore. I collected a dead *Pecten ziczac* from the sand — still in fairly good condition. *Argopecten nucleus* began appearing on the sand as well. I also picked up a *Strombus raninus* and a pair of *Pitar simpsoni*.

Everyone else was out near the boat channel shelling the sand, but I stayed in the grass. And then I found IT! The IT I have been searching for for the last 7 years — a live *Cymatium femorale*! It is small — just under 3" — but perfectly beautiful. Of course I had to go back to the boat to get my camera to immortalize the event. On the way back I found a *Cymatium moritinctum caribbaeum*, crabbed and trapped between the fronds of some foliage. A few feet away, an *Epitonium albidum* turned up, dead on the sand. And then another *C. femorale*, about the same size, crabbed, but in very good condition. Nancy Gale also found a crabbed one.

As I swam over another large bed of turtle grass, I came upon a convention of helmets. I have never seen *Cassis tuberosa* in such numbers before, all sitting on top of the sand and grass. You could pick and choose which one you wanted. Most of them were pretty encrusted on the back side, but the shield sides were beautiful, ranging in color from deep purple to light peach and tan. I think everyone brought back at least two or three helmets to the boat where we lined them all up and made our final choices. Linda found the only completely clean one, and Mark found the only *C. flammea*. Back to our hotel. What a day!

Day 3 — It rained heavily all night and most of the morning. We finally left around 11:00 and motored south to Cubee Jack's Cay where we anchored close to a broken dock and a small harbor. I searched just below the shoreline for hermit crabwarrens, hoping to find hermit crabs with the good taste to choose *Cymatium* condos. Finding a small patch of turnable rocks, I lifted one and set it aside, upside down, making a mental note to check out a rather ugly green blob of a shell attached to

the underside. Underneath the rock was another cluster of hermit crabs, and I scanned them closely for any hidden treasures. Only after I discerned that there were no interesting finds in the bunch did I belatedly remember to look at the unknown shell still valiantly clinging to its place on the rock. I remember thinking it was probably one of the *Latirus* shells that are so difficult to clean. I plucked it from the rock, turned it over, and ...Oh my!!! I beheld the beautiful lavender aperture of *Bursa thomae*. A new species for my collection, and one I never even hoped I would find! I swam out to the boat to share my find with the other six assembled there, but they were more interested in Kevan than in what I had found.

They were witnessing Kevan's "I've found something very special" behavior — fins in the air much more than snorkel and confined to a very small area. We motored over to investigate. He had found a patch of *Epitonium worsfoldi*. Naturally, Mark and I had to join in the fun. I discovered both the advantages and disadvantages of wearing coral gloves. The gloves protected me from all manner of biting and stinging beasties, but made it almost impossible to pick up the tiny wentletraps. Although I found three, I only collected one. The second escaped down a crevice in the substrate, and the third I simply couldn't pick up — it was too tiny.

When the rest of the group joined in the hunt, I and my camera swam along south of the ironshore. Under a corroded sheet of metal in 3' of water I found two *Phyllonotus pomum* which had just finished laying eggs. I had the soon-to-be offspring pose with their proud parents for several portraits before snorkeling back north where I found a fairly advanced mini-reef environment. There were dozens of sea fans, and almost every one sported at least one *Cyphoma*. I diligently searched every one, hoping for a *Cyphoma* that was not *gibbosum*, but no luck. And I took a picture of almost every one as well, hoping to get THE definitive Flamingo Tongue picture. See what you think about my favorite.

Day 4 — Rain, rain, rain, and MORE rain. We watched all the morning talk shows on TV. Not exactly what we had hoped to be doing, were supposed to be doing — but we had no choice. We finally braved the sea and the weather around 11:00 and headed to the lee side on Lubbers' Quarters, where we had noticed a forest of sea plume trees as we passed by them yesterday. Seven of us spread out approximately where we thought the trees were, and Kevan took off around the other side of the island. Seven of us didn't find any sea plume trees. Guess who did.

After harassing every sea cucumber in the area (hundreds?), I finally found two with live *Melanella* who agreed to have their picture taken. A *Trivia quadripunctata* found under a long dead coral branch also posed. The bright pink shell was completely encompassed by the black, velvety mantle of the animal. I was pleased to find a dead *Cheila equestris* in the sand and 3 species of *Dentalium* as well.

We seven got back in the boat and motored slowly around the island until we found Kevan, and the sea plume trees. These soft corals were truly beautiful, swaying back and forth with the motion of the water, like underwater weeping willows. They also had a good population of *Cyphoma gibbosum* and *Pterycolymbus* on them and *Coralliophila caribaea* clinging tenaciously to their holdfasts.

We moved on north to Sandy Cay — the one which is just off Man-O-War Cay. We anchored in the lee of 2 large limestone outcroppings on the southwestern side of the Cay. The bottom was clean sand, about 8' deep. At around 6' we found turtle grass beds. Around the rocks there was a hard bottom with a light covering of sand. There were also a few dead coral slabs with smaller pieces of coral to turn. I had just found 3 *Seila adamsi* under one of the slabs when I heard Karlynn yell. She was sitting up against the limestone outcropping with her legs stretched out in front, flippers in the air, brandishing a shell. There was a silly

grin on her face — she had found her *Cymatium femorale* in the rocky reef area in about 3' of water.

No more interesting finds, so we moved on to Matt Lowe's Cay and anchored in the bay on the southwest side in about 3'. The bottom was medium heavy turtle grass interspersed with mounds of sand. I first checked out a small island of mangroves in the far corner of the bay. Found *Littorina angulifera* on the roots above the water line and *Isognomon alatus* in clumps further down. I also disturbed a green heron apparently guarding a nest in the mangroves. The bird was so obviously agitated that I left the area.

Under a waterlogged piece of wood, I discovered several *Zebina browniana*. Found several miniatures in the sand, including *Crassispira fuscescens*. I picked up what I thought at the time was some type of auger. I put it down, thinking I already had enough augers. I started to swim away, changed my mind, found the shell again, and stowed it in my bottle. I am very glad I did as it turned out to be *Triphora decorata*.

I saw Karlynn at the boat motioning me to come in as well. We had forgotten that the tide was going out, and now we were in danger or being grounded. No one else was in ear shot, and it was urgent that we move to deeper water — the hard way. Karlynn swam just in front of the boat and dragged it by the forward anchor line. I was in charge of moving the anchor. I worked out a system where I picked it up with both hands, threw it forward, and let its motion carry me along as well. Not a very graceful way to make headway, but it worked.

We tried to check out several other places, but the rain was coming down again, and everyone was pretty miserable. We decided to call it a day.

That night I carefully arranged my gear out on the porch to let it dry. Shortly thereafter, a real tropical squall hit. Nothing was going to get dry tonight. Kevan and Linda had told us about "putting their clothes in the dryer", so after dinner I went down to their room to spy out the procedure. Their "dryer" was the ceiling fan, from the spokes of which they had hung their wet clothes to be "blown dry" as the fan revolved. The trick is to balance the weight of the clothes so no particular spoke dips. Sandy and I tried it out and were amazed at how fast the clothes dried. Looking up at our room from outside, however, gave the impression that someone was hanging from the fan as it went round and round.

Day 5 — A tropical depression blew up from Cuba during the night and is supposed to last for at least two days. The rain has been pouring down all night, and the wind is very strong. Kevan had said we would leave at 9:00 "come hell or high water." As we had both, we didn't leave until around 11:00. We headed south toward Pelican Cay. At first the weather didn't seem so bad. The temperature was warm, and the rain was falling lightly and straight down, not at crazy angles. But once we passed Tilloo Bank we ran into a churning mixture of huge rollers from the open ocean, heavy current and strong winds all pushing us different ways at the same time. The rollers were actually higher than the canopy of our boat at times. We played rock and roll, rising high with wave after wave and slapping down into the sea so hard I thought the boat was bound to break apart. I seriously considered what it would be like to be stranded in the water for hours until we were rescued, and I was grateful Sandy, who prudently remained at the hotel, knew where we were headed. I was not the only one who was worried. Mark said later he thought we all should have been wearing life jackets just in case. The faces of some of the others told their own tales.

Finally we made it to the lee side of Lynard Cay. The water was actually calm here, and we were so thankful to be in one piece that we stopped to snorkel for a while. Linda found a *Cyphoma gibbosum* making tracks across the sandy bottom, a sight neither of us had ever seen before. It was amazing how fast that shell could boogie across the bottom. I had never seen them anywhere but on sea fans and soft corals before. Perhaps he was

blown away from his home by the storm and was just trying to get back. I found a live *Morum oniscus*, and I was hopeful of recovering the operculum from him. Mark had found an operculum in one last night and I was impressed (OK, maybe jealous is a better word!).

As we were snorkeling, amazingly enough, the sun came out, the clouds started to disperse, the sea calmed, and it turned into a beautiful day. We moved on to the northern end of Pelican Cay. We intended to try to snorkel through the cut between islands into the Atlantic. Talk about roly-poly! The swells were 5-6', rolling in from both sides of the small island. We weren't too sure that the anchors would hold, so we stayed fairly close to the boat.

Only in Florida in recent years have I seen as many fully mature *Strombus gigas* as we found on the bottom, perhaps 12-15' deep. We also found large *Cassia tuberosa* again, just sitting on the sand on turtle grass in plain sight. I found a beautifully clean *Cassia flammea* the same way, and I couldn't resist it. In fact, I didn't even try.

I was getting tired fighting the seas and was having trouble with my mask fogging up as well. I decided to wait on the stern anchor line for the others to return (definitely NOT in the boat!). On the way there I spied something melon-colored in the turtle grass. It turned out to be a dead *Tellina laevigata*, another new species for the collection.

We were all pretty tired after fighting the heaving waves for so long, so we decided to head in. But we couldn't pass up a pretty white sand beach on the east side of Lubber's Quarters, directly across from Tahiti Beach. The beach itself was strewn with trash. The bottom was heavy turtle grass with not much visible sand. There was a slight incline just off the beach, and I swam along just below the tideline, looking for miniatures. Found a crabbed *Janthina janthina* in perfect condition. I also picked up several crabbed *Truncatella pulchella*. At first I thought they were broken, until I remembered the unusual blunt spire of this family.

Day 6 — Despite the beautiful afternoon yesterday, it rained again overnight, and the day dawned—sort of—cloudy and overcast and hot and muggy. We left at 9:00 and headed for the northern Sandy Cay. We anchored just south of Sandy Cay in the lee of the low rocks shown on the chart. I was pleased that I took my camera with me as I found a small but active *Fasiolaria tulipa* who performed well under pressure. I turned him on his back several times and photographed his righting procedure. I have found that Tulip shells are very active and cooperate very well for the amateur photographer. In thanks, I hid him under some foliage before moving on. I also found a free-swimming *Lima scabra* and snapped several pictures of him with his beautiful orange tentacles out.

We moved on to the Sugar Loaves. While most of us stayed to the north of these islets, Mark crossed over to the south side and found the prize. He discovered some *Lithophaga antillarum* hidden in soft coral rock. The rest of the group were all aboard when he returned and showed off his finds. Of course, Vicky and I decided we just had to have some of these mussels, so back in the water we went. I was belly crawling over the shallows when I spotted a dead *Cymatium femorale*. However, I didn't see the patch of fire coral right under me when I reached for the shell. Interesting how fire coral can go right through a skins suit and a bathing suit. Well, maybe interesting isn't exactly the right word. As I recall, I did utter several four-letter words at the time that were far more appropriate. Did you know it is possible to whimper through a snorkel?

After collecting the mussels, I was checking sea fans for *Simnia* and found a few *Coralliophila caribaea* instead. I was showing them to Mark when we noticed Vicky in the water behind us, sputtering and waving her arms and shouting at us. We couldn't understand what she was trying to say until she thought of the operative word — Stone Fish, just two inches below my right knee! Back paddle!

(Continued on page 8)

ELBOW CAY TREASURES

(Continued from page 3)

Some of the group were tired, so we returned to the dock to let them off. The rest of us took off again, but it was not to be. Just opposite White Sound the steering cable of the boat snapped, and we had to limp home, able to make only right-hand turns. Mark sat in the back beside the motor and pushed on it with his feet if we needed only a slight adjustment to the left. In slow motion, and with repeated right turns to correct our course, we managed to hobble back to the dock.

I guess all good things must come to an end. If they didn't, how would we know when to appreciate the really great times? Elbow Cay will remain in my memory as one of the best shell trips I have ever taken. Sure am glad I keep a journal to remind me of the people, places, and things (shells) of the trip later on.

Clockwise from top left:

My first Angular Triton

A conch condo!

Fasciolaria tulipa righting itself.

Melanella on the bottom of a sea cucumber

Center:

Cyphoma gibbosum on hard bottom



9. *Scaphella*

2. *Alcihoe*

Natal Museum in Jeopardy . . . Needs Help!

The Natal Museum in South Africa houses a particularly fine mollusk collection, with representative and extensive samples of southern African and Mozambican mollusks in existence, and is particularly rich in material dredged on the continental shelf and upper slope. It is worldwide in scope and is by far the largest mollusk collection on both the African continent and the entire Indian Ocean rim (the molluscan type collection alone contains 2 633 lots.) Among other services to the molluscan community, it has, over the past 30 years, published 91 taxonomic papers and one book (Kilburn & Rippey 1982). Current projects include a guide to the non-marine mollusks of eastern South Africa, which will be followed by an identification manual on marine mollusks. A detailed, annotated catalogue of the S.A. marine molluscan fauna is also currently under preparation. At a global level they appear to be among the relatively few surviving institutes still actively undertaking taxonomic research on their molluscan faunas. A rather impressive record, right? An institution worth preserving.

However, the survival of the Natal Museum as a research organization is under serious threat. The museum has been funded nationally, but now political restructuring has decreed that this museum will become a provincial Arts and Culture Museum.

Dr. R.N. Kilburn and Dai Herbert send us the following plea for our help:

"Anyone who has ever used or might one day need our collections or other facilities, who has read a paper in which they are cited, or who has the foresight to appreciate the consequences

of the irretrievable loss, please send messages of protest to our government bodies, appealing for the collections of the Natal Museum to be recognized as both a national and an international resource, which merits funding from the highest government level, and should under no circumstances be side-lined to provincial custody.

"Please send your protest in the form of an e-mail message to the Minister of Arts, Culture, Science and Technology (012 - 325 2768). However, we would be further indebted if you would also FAX copies of your message addressed to: (1) the South African Embassy (High Commission in Canada): U.S. 202 986 5712; Canada 613 7411 639 (2) the Minister of Environmental Affairs and Tourism, Pretoria, South Africa (012 - 3222 682), and (3) the Office of the State President, Pretoria, South Africa (012 - 323 8246)

"Please give our plight a few moments of your time."

Bailey-Matthews Awards Visiting Curatorship

Mr. Gary Coovert, Curator of Biology at the Dayton Museum of Natural History, Dayton, Ohio, was selected as recipient of the first R.T. Abbott Visiting Curatorship. Gary will visit the Shell Museum in November to help in curating the marginellid snails in the Bailey Matthews Museum's scientific mollusk collection.



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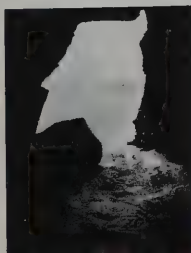
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THE "SILVER EDITION," COA'S TWENTY-FIFTH ANNIVERSARY

By Jean Roe, COA Secretary

Photos by Georgette Laforet, Convention Photographer (G.L.); Faye Mucha (F.M.); Rosalie Taylor (R.T.); John Parkhurst (J.P.)

A little glitter and a lot of memories — What better way to celebrate an anniversary?!

Anne Joffe and the Sanibel-Captiva Shell Club had promised a special celebration for the twenty-fifth anniversary of COA and they certainly delivered. From the tiny silver "sprinkles" tucked into the registration forms to the elegant black and silver chair covers and exquisite table decorations at the banquet, the "Silver Edition" was special.

A record number of attendees enjoyed the facilities of the beautiful South Seas Plantation in its tropical setting on Captiva Island, FL. Many first-timers, as well as veterans like Herb Young, who was attending his twenty-third COA Convention, met new friends, talked shells, laughed, learned, and carried away memories of the five days between July 13 and 18.

The fun started with early registration on Saturday, July 12, when canvas totes with Sue Stephens' beautiful design incorporating the COA logo and the Junonia of the Sanibel-Captiva Shell Club were handed out. Inside were lots of "goodies," including shells, Christmas cards and word games. Pre-convention field trips started this afternoon also, with groups heading out to Pine Island Sound.

Although the opening ceremonies would not take place until after lunch, Sunday morning found the convention hall buzzing with activity as new arrivals stopped to buy a convention tee shirt

105 Markham Place, Portland, TX 78374-1417. Email: jandcroe@aol.com

from Pat Burke or raffle tickets from Ben and Josy Weiner or maybe just to peruse the Silent Auction or the Walter Sage fabric. Convention photographer Georgette Laforet recorded it all.

Registration Chairmen Howard and Susan Roux seemed to be everywhere, handing out totes, answering phones, gluing errant magnets back onto name tags. From her vantage point at the desk Susan was also keeping track of the UPS trucks delivering "Beanie Babies" to the store across the street and alerting eager collectors. . . even some of the dealers have fallen under the spell of the cute and cuddly "Beanies."

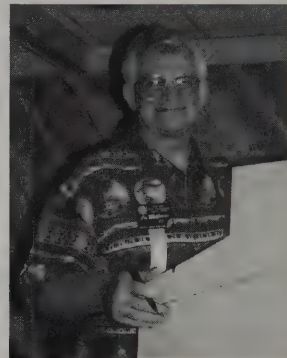
Mixing with the many Floridians who were close to home were others from far away: Tom Rice, Trevor Roberts, and the Youngs from Washington; from Italy the Angioys and Bruno Briano; the Coltro brothers from Brazil; a large group of Texans; several Australians; Brian Hayes and family from South Africa; and on and on. We are truly becoming an international group!

Opening ceremonies included a welcome from Anne Joffe, acknowledgment of shell club reps, greetings from COA President Dave Green, and an invitation to an open house at Bailey-Matthews Shell Museum from its scientific director, Dr. José Leal. José also was our first speaker and showed us slides of the museum's progress.

Cesar Rodriguez told us about successfully raising clams at nearby Charlotte Harbor. He was followed by Rich Goldberg, who



Norma Chuback (left) joins Registration Chairmen Howard and Susan Roux for a quiet moment at the registration desk. Howard is the new COA Historian, replacing retiring Bev Deynzer. (G.L.)



Master of Ceremonies of the COA 25th Anniversary, Silver Edition, Jim Whitehouse. (G.L.)



Steve and Debbie Wills watch the server carve their standing rib at the Welcome Party, while Nancy Fritz helps herself to the horseradish cream. What a party! (G.L.)

Four lovely hostesses at the Silver Edition Welcome Party Sunday night: Vivienne Smith, Biddy Dean, Anne Joffe, and Irene Longley, Convention Treasurer. Where's Georgette? Taking pictures, or seeing about more food? (F.M.)



Three Past Presidents intent on the speaker: (from left) Peggy Williams (1989-90), Tom Rice (1974-75) and Alan Gettleman (1988-89) (R.T.)



Hank Chaney at the Bailey-Matthews Shell Museum Open House. Hank was both speaker — "Mad Dogs and Englishmen" — and co-auctioneer. (G.L.)



Are those common on the beaches in South Carolina, Dick? Dick Petit, our co-auctioneer, shows off a *Kuphus* shell before starting the bidding. (F.M.)

Christine and Charlie Barr and Clair Hendrickson enjoy "Cheeseburgers in Paradise" during the Cabbage Key Cruise. Is that real money upholstering the railings? (G.L.)



took us in search of land snails in the Spice Islands. Betty Jean Piech left us laughing at her cute brand of humor as she shared her memories of thirty-seven years of shelling.

The Welcome Party Sunday evening under the direction of Bidy Dean and Georgette Laforet seems to have solved the problem of making sure there is enough food for everyone. It was great! Afterwards, Rosalie Taylor had arranged a Conch-L get-together, so the Conch-L crew could get to know one another in person. We each received a tiny sticker for our name tag with a pink conch and "L" on it. A clever idea.

Monday morning started with club sales, more Silent Auction, and sales of the Walter Sage fabric. After door prizes from Dot Whitehouse, her husband Jim got things underway as master of ceremonies. Tom Watters told of "America's Most Imperiled Fauna," freshwater mussels, and we learned there isn't much we can now do to prevent some of them from extinction. Doug Jones of the Florida State Museum taught us how he predicts the age of shells from growth rings and that it is possible to predict at what season of the year shell material was added.

During Open House at the Bailey-Matthews Shell Museum we toured the Great Hall of Shells, explored the library and storage facilities, asked questions, viewed the computer program Ross Gunderson is working on, and enjoyed snacks. It is a good feeling to know we have contributed to the development of this exciting place with our contribution of funds for the entry desk.

Back to the convention center for afternoon programs: Harry Lee gave us a look at the fascinating dove shells of the Western Atlantic, some of them unnamed." Dr. Jerry Harasewych took us to view Pleurotomariidae via submarine; and Brian Hayes brought us more of his excellent photography of living shells, this time of deep water mollusks of South Africa.

After a hot sticky day it was inevitable that raindrops would start to fall just as the *Lady Chadwick* was departing for Cabbage Key. Most of us managed to keep dry under cover, but Ken

Trauernicht and kids just stood in the stern and enjoyed the rain. Once at Cabbage Key, former home of author Mary Roberts Rinehart, we were served the traditional "cheeseburger in paradise," made famous by the Jimmy Buffet song of the same name. Many of us left behind a dollar bill with a message, taped to the wall so others will know COA was there.

During Tuesday morning announcements, Ted Metzger was named the winner of the shell count for his guess of 752 olives in the jar.

The Annual Meeting began with a special ceremony as President Dave Green presented plaques honoring the service of past presidents. Happily, many of them were present: Tom Rice (1974-75), Dick Forbush (1983-5), Anne Joffe (1985-86), Rich Goldberg (1986-87), Don Young (1987-88), Alan Gettleman (1988-89), Peggy Williams (1989-90), Hank Foglino (1990-91), Glen Deuel (1991-92), Doris Underwood (1992-94), Linda Koestel (1994-96), and Dave Green (1996-97). A good looking bunch! Sadly, 1980-81 president Wayne Stevens passed away just before the convention. He will be missed.

Dave then presented each of the current COA Board members with a plaque of appreciation. A special plaque was presented to Lynn Scheu in honor of "Ten Years of Excellence as Editor of *American Conchologist*."

To begin the business portion of the meeting, minutes of the 1996 Annual Meeting were approved as printed in the welcome packets. COA Treasurer Bobbie Houchin read the 1996 Summary Treasurer's Report. Educational Grants Director Dr. Gary Rosenberg read the list of 1997 COA Educational Grants recipients. Guido Pastorino of Washington, DC is the 1997 recipient of the Walter Sage Award. He will conduct a study of Antarctic *Trophons*.

Larry Stiles made the report of the nominating committee composed of Eleanor Hillman, Glen Deuel, and himself. The slate

(Continued on page 12)

THE "SILVER EDITION," COA'S TWENTY-FIFTH ANNIVERSARY (Continued from page 11)

was approved by acclamation Your new officers are ;

President: Dave Green

Vice President: Linda Brunner

Secretary: Jean Roe

Treasurer: Bobbie Houchin

Trustee: Rosalie Taylor

Linda Koestel presented a slide show on the 1998 convention "Discover the Magic" at Walt Disney World in Orlando, July 19-23. She's working to get Mickey to join us.

At the close of the Annual Meeting, Linda Sunderland stepped up to present Lynn Scheu with a special "memory book" of her ten years as editor. Happy tears all around for a well-deserved tribute.

A different type of auction awaited us on our return from lunch. It was different in that items were not auctioned in sequence, so bidders had to stay awake and on their toes. Auctioneers Dick Petit and Hank Chaney played their audience along and garnered an amazing \$8,142!

The night dive trip departed while the rest of us hurried to get dinner in time to attend the symposium on techniques and products for shell collectors. Here we learned the importance of proper storage, the difference between "good" and "bad" foam, and that polyfil is better than cotton. Many other tips were given by panelists Dr. Hank Chaney, Dr. José Leal and Alice Monroe.

We later learned the divers had had a few problems with the boat, weather and seasickness. But shellers are a hardy bunch. They came dragging in at 6 AM. Of course none of them were at the Club Reps breakfast. Too bad. It was a very productive meeting with lots of good ideas exchanged.

A few changes were needed in the program line-up on Wednesday morning due to misfortunes of some of the presenters. Kermit and Gloria Pearson gave a very interesting talk on live shells of Kwajalein in place of Ross Mayhew, who was delayed in Canada. Peggy Williams took us shelling in Baja and then Emilio Garcia filled in for Emily Vokes, who had cancelled when Harold broke his hip. We wish them well. Hank Chaney told of dredging in the Pacific. A good morning of programs in spite of the changes.

At 3:00 PM the doors of the Bourse opened with the usual frenzy — 105 tables of shells, books, and shell-related items greeted eager shoppers. Next morning found last minute shopping going on until noon. Afternoon programs by Hank Foglino and Alice Monroe each dealt with seashell shape and sculpture and served to complement one another. Gertrude Moller's cartoons on "Molluscan Humor" had everyone smiling, a great wrap-up of programs.

The banquet provided the perfect setting for an anniversary celebration. Black and silver balloons floated along the wall, while tiny lights twinkled in the plants and in the lovely centerpieces, designed by Goz Gosselin and created by Anne and her team.

After an excellent dinner, Rusty Brown recited passages from Anne Morrow Lindbergh's *Gift From the Sea*. She almost became Anne as she took us back in time to the days when Anne walked on Captiva and collected shells. It was a beautiful and memorable evening, a fitting finale to this special anniversary for COA.



1986-87 Board of Directors, recognized by President Dave Green with individual plaques. From left, front row, Linda Koestel, Dave Green, Linda Brunner, Jean Roe, Bobbie Houchin, Betty Jean "The Tall One" Piech, Betty Lipe, Bev Deynzer, Lucille Green and Amy Edwards. Back Row: Jim Brunner, Rosalie Taylor, Ruth Ann Sparlin, Donald Dan, Gary Rosenberg, Hank Foglino, Lynn Scheu and Phil Dietz. The 1997-98 Board is the same, with the exception of Beverly Deynzer, who is retiring. Howard Roux will replace her. (J.P.)

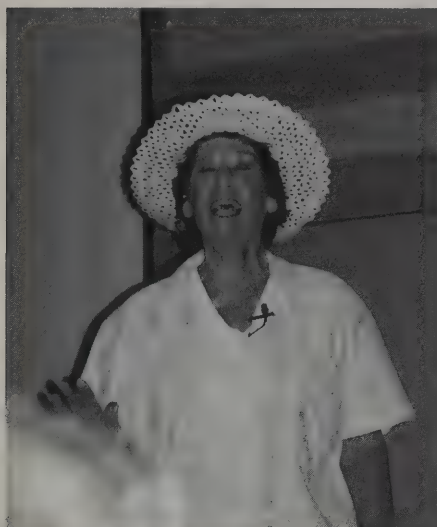
1. *Tracholira*



One of the gala black and silver banquet tables at the 25th Anniversary Banquet, Silver Edition. Our Sanibel-Captiva hosts really outdid themselves. (G.L.)



COA President Dave Green flanked by Lucille Green, Membership Director, and Linda Koestel, Past President. (J.P.)



Banquet speaker Rusty Brown treats a rapt audience to her interpretation and readings from Anne Morrow Lindbergh's *Gift from the Sea*. (G.L.)

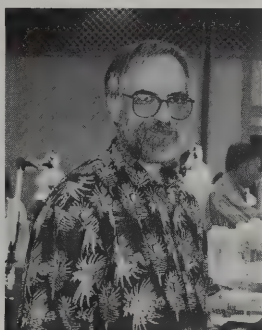


Maria Antonietta Angioy (left) joins Dr. Jose Leal and his wife Sylvia, Ross Gunderson, and Dr. Donald Moore (left) at the pre-banquet cocktail party. (F.M.)

CONVENTION HEROES



Ruth Ann Sparlin, our able and intrepid Parliamentarian. (F.M.)



Phil Dietz, COA's very own auditor. (G.L.)



Anne Joffe, 1997 Convention Chairman, elegant as always in her black and silver banquet togs. (F.M.)

COA wishes to thank our able and intrepid Ruth Ann Sparlin, who served us well as Parliamentarian at the COA convention board and annual business meetings. Our dedicated auditor for 1996-97, Phil Deitz, is also due a big round of applause for his struggles with all those numbers. Listen Phil and Ruth Ann. . .that sound is the cheers of COA members all over!

The Conchologists of America wishes to thank the Sanibel-Captiva Shell Club, the Bailey-Matthews Shell Museum and its volunteers and employees, the 1997 Captiva Convention Committee and especially Convention Chairman Anne Joffe, for a truly wonderful week-long 25th Anniversary Party! We had a wonderful time!

6. *Cymbiolista*

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 Vice-President: **Linda Brunner**, Southport, FL
 Secretary: **Jean Roe**, Portland, TX
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NOTICE NOTICE NOTICE NOTICE NOTICE

U.S. MEMBERS ONLY:

Due to increasing postal delivery delays, COA decided in July to offer optional first class mail delivery rates to its **U.S. members only** for a \$5.00 annual add-on charge. This service will be available by request. Bulk Mail service is still available at the current domestic rate of \$20.00.

How does it work? First Class service is available to you only if you live in the U.S. (Those who live outside the U.S. already get Airmail Service. See below for those charges) Your basic U.S Bulk Rate Membership costs \$20.00. If you want your *American Conchologist* delivered as Bulk Mail, enclose a check for \$20.00. If you want to receive your *American Conchologist* First Class, enclose a check for \$25.00. (\$20.00 + \$5.00 postage charge)

PLEASE NOTE: COA dues increased last year to help offset the expense of your *American Conchologist*.

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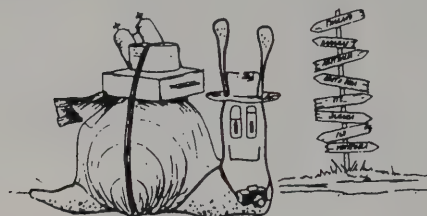
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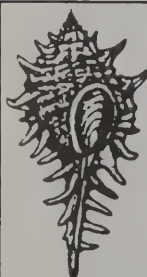
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PROPOSED CLOSURE OF AUCKLAND MUSEUM'S MARINE DEPARTMENTS, NEW ZEALAND, ABANDONED DUE TO PUBLIC OUTCRY

It was announced on July 3 that, because of an increase in administrative costs, the Auckland Museum was proposing to close down its long-established marine departments (formerly Malacology Dept) and would no longer be involved in these areas, which also include paleontology. The Museum's Marine Departments care for major biological, especially mollusk, collections stretching back over 100 years. They grew substantially under the 50 years of custodianship by Dr. A.W.B. Powell (1920s-1970s), who established one of the largest and most comprehensive mollusk collections in the southern hemisphere (150,000 lots, 1,600 holotypes, impressive landshell collection for SW Pacific, and a large fossil mollusk collection). In-progress and proposed research projects were to be eliminated as well. All but two (the curators) of the staff of 20 workers in the department who were to be declared redundant, were either volunteers or were funded by outside grants.

An appeal went out to the public and the scientific community about this appalling state of affairs. And guess what! It worked! Over 200 letters and faxes, and numerous petitions poured in, and large numbers of supporters attended the hearings on the subject. The Museum's board relented, at least in part. The Trust Board and management, faced with this level of public feeling,

decided that the marine collections (including fossils) are after all very valuable to Auckland and the Museum and have stated that they will keep them and look after them.

The two curators have been let go, but most of the others have been kept on and the possibility remains open for replacing the curators in years to come. There has been other scaling back. Hopefully access to the collections by outside researchers can be maintained

in the meantime - but these are early days in the new regime. The Auckland Museum collections include the historically significant collections of H.J. Finlay and A.W.B. Powell and comprise some 130,000 mollusk specimen lots including the most important collection of NZ and SW Pacific land snails and the holotypes of over 1600 Recent and fossil New Zealand mollusca.

There is a lesson here. As it becomes more expensive to fund public institutions like museums and parks, their supporters will have to remain vigilant in their behalf and ready to spring into action.

SHELLY STOCKING STUFFER?... JUST MAYBE!

The smart shoppers among us are already looking ahead to holiday season, sniffing out bargains and stockpiling gifts. A perfect gift for that shell collecting friend or a grand stocking stuffer for one's significant other could just be the marvelously shelly computer screen saver from the Bailey-Matthews Shell Museum. This gem of a product is now under development; once it's available, you'll be able to install it on your computer in minutes. Then visions of pectens and tulips, doves, turrids and lucines, all from the beaches and waters of Sanibel Island, will fill your idle, reflective moments behind the keyboard.

A clever project designed by photographic whiz, Ross Gunderson, under the auspices of Dr. Jose Leal and the Bailey Matthews Museum, the Seashells of Sanibel screen saver is now entering production. When complete, it will be a first! An outgrowth of their soon to be released CD-ROM Shell Guide, "The Seashells of Sanibel Island," it features 24 plates borrowed from the CD-ROM. Each will stay on your screen for five seconds, as full screen graphics on a black background.

Speaking of that CD-ROM, WAIT TIL YOU SEE IT! It was available in part for demonstration during the Museum Open House for the July COA Convention. This amazingly innovative



FLOWERS TO:

COA Convention Treasurer **Vivienne Smith** who lost her husband in July. Vivienne, we all send our love and support and condolences in this sad and difficult time.

COA Public Relations Director **Betty Jean Piech**, who had to fly home from the convention to be at her husband Frank's bedside. He suffered a major heart incident and underwent a successful quadruple bypass operation.

Our old friends **Harold and Emily Vokes**. Harold Vokes fell and broke his hip just before the convention. We missed you both, Harold and Emily, and hope things go well for you.

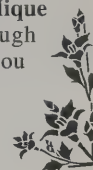
Norris McElya, Greater Miami Shell Club, who is quite ill after triple bypass surgery May 30. Norris has gone to Colorado via an air ambulance so his sister and family members can be near him. Faye Mucha sends word that he'd love some cards and letters c/o Mrs. Nell Van Driel, P.O. Box 441, Ft. Collins, CO 80522. He is staying in a nursing home there for further recuperation.

Longtime COA members **Sol and Mary Weiss**. Sol has been ill and was unable to attend the convention. We hope you are feeling better now, Sol.

Phyl Pipher and Bernie Pipher. Phyl has been in the hospital with some complications and we sorely missed them both at Captiva in July. Get well soon, Phyl!

Donn Tippet who, we hear, is doing fine after his early July surgery.

We were glad to see **Pinky Pinkerton** and **Herb Young** in Captiva. Both of those perennial COA supporters have been very ill, but were recovered enough to make the July trip to Florida and attend the convention. The flowers go to **Mique Pinkerton** and **"Butch" Young** who got them through recovery and back to our ranks. It was great to see you all!



new "book" held us all spellbound with its beauty, quantity of information, and versatility. Oops... wandering from the topic... more later.

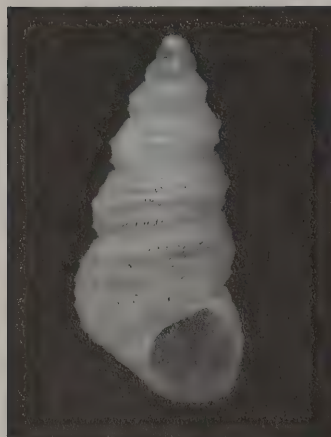
So far the Seashells of Sanibel Screen Saver will be available only for PCs (Sorry, Macs, you'll have to wait even longer than PC users.) System requirements will be a 486-33 processor, 640x480 graphics, 32K or 64K or 16M colors, 12mb RAM. Will run on a 386 or 486 computer with 8 mb RAM. Price and release date are yet to be announced. Hmm... Christmas would be nice...

OOPS! SLIT SHELLS MISLABELED

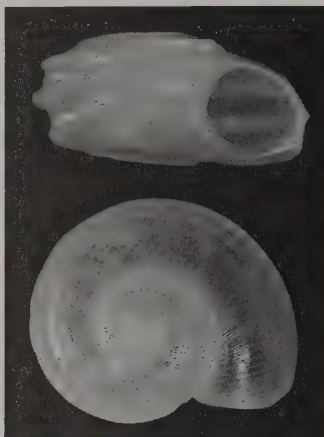
In the June 1997 centerfold, "Shells from the Bailey-Matthews Collection," pp. 16-17, by Kevan and Linda Sunderland, two photos were transposed. The shell captioned "*Perotrochus amabilis*" (two photos, upper left, p. 17) is actually *Perotrochus maureri*, while the shell labeled *Perotrochus maureri* (two photos, second row, right, p. 17) are *Perotrochus amabilis*. 11. F. Fustoluc

Selected Microgastropods from Sanibel Island, Florida or The Fruits of Collecting During the 25th COA Convention

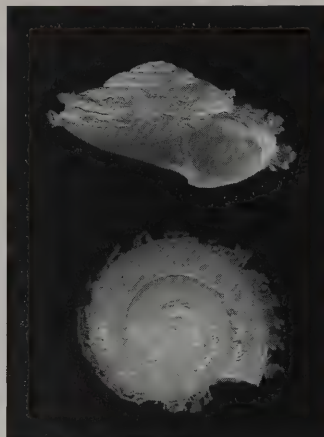
by Ross Gunderson



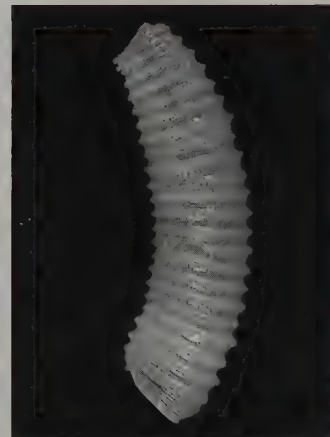
OBTORTIONIDAE
Finella adamsi (Orbigny, 1841) -
Adams' Alabine. 3mm.



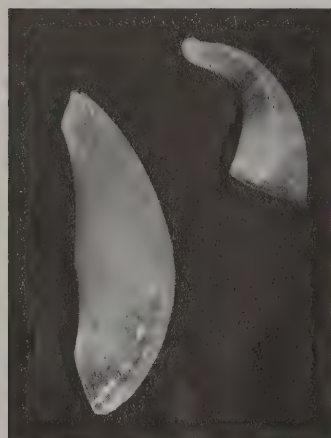
VITRINELLIDAE
Cyclostremiscus suppressus (Dall,
1889) - Supressed Vitrinella. 2mm.



VITRINELLIDAE
Episcynia inornata (d'Orbigny,
1842) - Hairy Vitrinella. 2mm.



CAECIDAE
Caecum pulchellum Stimpson, 1851
- Beautiful Little Caecum. 2mm.



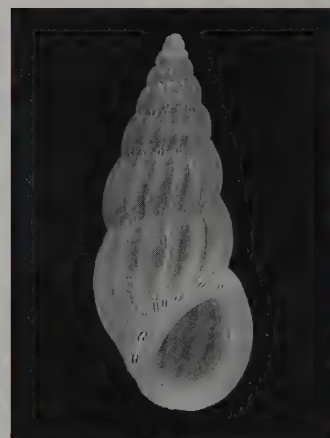
CAECIDAE
Meioceras nitidum (Stimpson,
1851) - Little Horn Caecum. 3mm.
The shell on the right shows the
coiled initial growth.



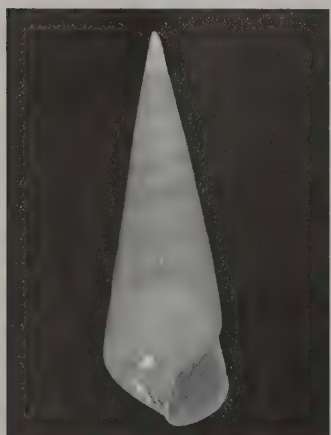
TRIPHORIDAE
Marshallora? modesta (C. B. Adams,
1840) 4mm. - A sinistral shell. The
protoconch is amputated and the
remainder is partly decorticate.



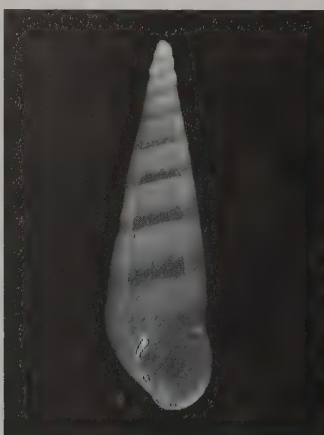
CERITHIOPSIDAE
Cerithiopsis sp. aff. *greenii* (C.B.
Adams, 1839) - 3mm. Unnamed.



RISSOINIDAE
Schwartziella catesbyana
(d'Orbigny, 1842) - Catesby's
Risso. 7mm.



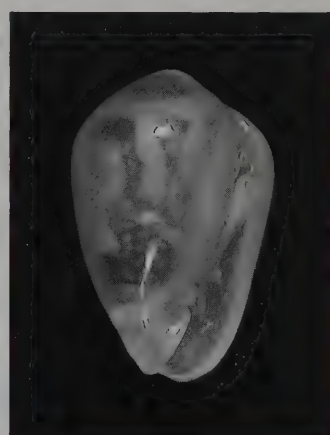
EULIMIDAE
Melanella conoidea (Kurtz and
Stimpson, 1851) - Conoidal
Eulima. 7mm.



EULIMIDAE
Microeulima hemphillii (Dall, 1884)
- Brown Eulima. 5mm.



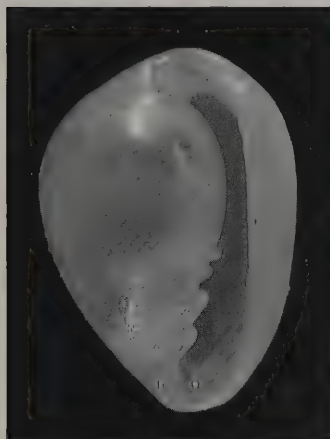
MARGINELLIDAE
Dentimargo aureocinctus (Stearns,
1872) - Golden-lined Marginella.
4mm. Black pigment spots, on the
animal, show through the
translucent shell.



CYSTISCIDAE
Gibberula lavalleana (d'Orbigny,
1842) - Snowflake Marginella.
3mm. Different colored pigments,
on the animal, show through the
translucent shell.

Specimens pictured on these pages were collected as part of an ongoing survey of the mollusks of Sanibel Island. Live collecting was conducted under a permit granted to the Bailey-Matthews Shell Museum.

Pictures were taken with a Panasonic WV-CP410 digital video camera with a Micro-NIKKOR 55 mm or 105 mm lens and extension tubes. A Minolta Snappy served as the frame grabber. Digital images were post processed with Aldus Photostyler.



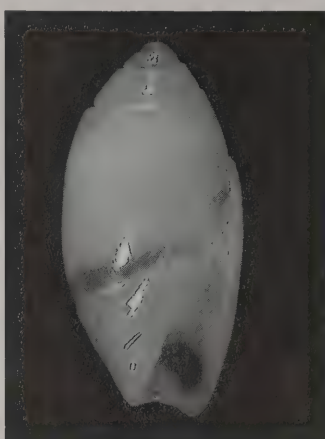
CYSTISCIDAE

Granulina lachrymula (Gould, 1862) - Little Teardrop Marginella. 2.5mm.



OLIVIDAE

Jaspidella blanesi (Ford, 1898) - Blanes' Dwarf Olive. 10mm.



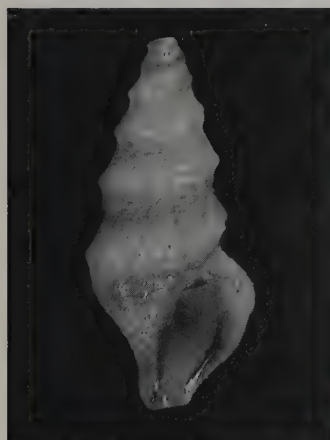
OLIVIDAE

Olivella pusilla (Marrat, 1871) - Tiny Dwarf Olive. 8mm.



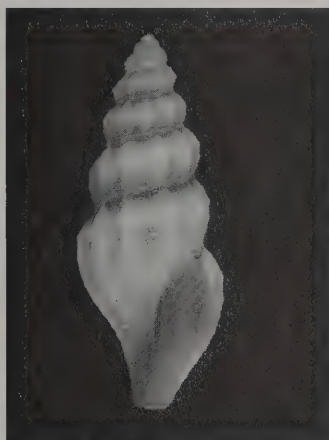
TURRIDAE

Pyrgocythara plicosa (C.B. Adams, 1850) - Plicate Mangelia. 8mm.



TURRIDAE

Nannodiella vespuciana (d'Orbigny, 1842) - 5mm.



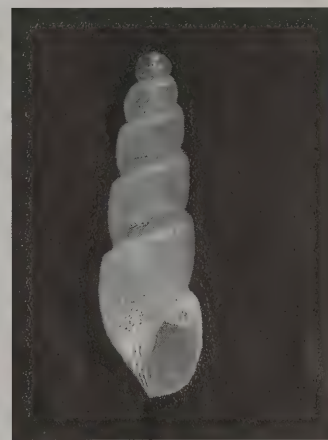
TURRIDAE

Kurtziella atrostyle (Tryon, 1884) - Brown Tip Mangelia. 8mm.



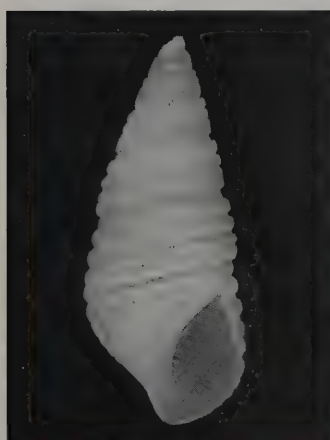
PYRAMIDELLIDAE

Turbonilla dalli Bush, 1899 - Dall's Turbonille. 12mm.



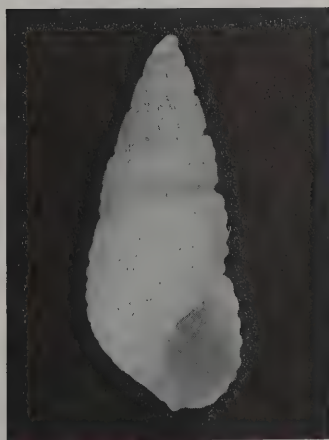
PYRAMIDELLIDAE

Carelopsis bermudensis (Dall and Bartsch, 1911). 3mm.



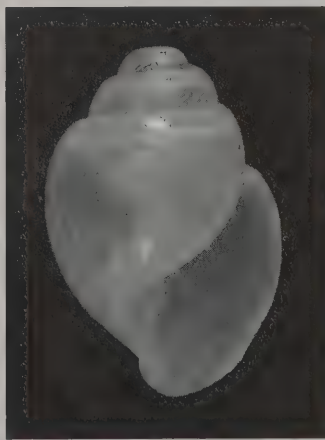
PYRAMIDELLIDAE

Boonea impressa (Say, 1822) - Impressed Odostome. 6mm.



PYRAMIDELLIDAE

Chrysallida buijsei deJong and Coomans, 1988 5mm.



ACTEONIDAE

Rictaxis punctostriatus (C. B. Adams, 1840) - Adam's Baby Bubble. 5mm. (juvenile)



CYLICHNIDAE

Acteocina canaliculata (Say, 1822) - Channeled Barrel-bubble. 4 - 6 mm

Many thanks to Jose Leal, Gary Rosenberg, Kevan Sunderland and Harry Lee for helping with the identifications.

BOOK REVIEW

Registry of World Record Size Shells by Kim C. Hutsell, Linda L. Hutsell and Donald L. Pisor. *Snail's Pace Productions, San Diego. 1997. Spiral bound, 8.5" x 11" iv + 104 pp. \$15.00 + \$3.00 s/h + tax. Available from Pisor's Marine Shells, 646 N.30th St., San Diego, CA 92102.*

It's not often that people line up to review a book, but that has been the case with the new Registry of World Record Size Shells. We offer you here two points of view, the collector-oriented one we requested from "Supersheller" Gene Everson and the excellent perspective Dr. Gary Rosenberg offered from his experience at the Academy of Natural Sciences of Philadelphia. We regret that we do not have space to include more.

This publication is a welcome successor to Wagner & Abbott's list of world records in their *Standard Catalogue of Shells*, and inherits many entries from that work. However, this is an entirely new work in many ways. The last supplement to Wagner & Abbott's list in 1990 included 2318 entries; the new *Registry* includes more than 4470. There are several other improvements. 1) The minimum size requirement of one inch has been dropped. 2) Sizes are listed in millimeters instead of centimeters (somehow 100.0 mm is a more appealing goal than 10.00 cm). 3) Species are listed alphabetically by trivial name within families, with families listed alphabetically, instead of within genera with genera alphabetized. This makes it easier to locate species, and prevents duplicate listing of a species in more than one genus. Strangely, bivalves have a separate section, but Dentaliidae, Argonautidae and Nautilidae are alphabetized with the gastropods; a single alphabetic sequence would be preferable. 4) A reference field has been added, which points to description or illustration of species. Updates are planned every few years.

To determine how robust the list is, I checked about one quarter of the entries against the collections here at the Academy of Natural Sciences. I found that for about ten percent of the entries, our collection has a larger specimen than listed (these will be submitted for the second edition). In general, the larger the shell, the harder it is to break the record, so if you want to look for world records in your own collection, the best bets are in the one to four inch range. You might get a certain satisfaction in breaking a record held by Victor Dan or Dan Pisor, with 369 and 325 records respectively in the current edition. A form at the back of the book allows submission of new records and new entries (for species not currently listed).

The *Registry* suffers from an unusual number of typographical errors, presumably because the authors rushed to have it ready for sale at the 1997 COA convention. There are also a number of cases of species being listed under two synonymous names, e.g., *Oliva sericea* and its synonym *O. textilina* are both listed, or under two combinations, e.g., *Ancilla lienardi* and *Eburna lienardi*. The authors would have been more likely to catch the latter type of error if they had included the author of the species, although the space limits of one line per entry might preclude this. I also noticed entries where the location is impossible (e.g., *Ancilla ventricosa* is from East Africa, not West Africa), which casts doubt on the identity of the specimen.

Of greatest concern however is that many of the world records in the *Registry* are smaller than the maximum size listed for the species in the standard work on the group. For instance, compare maximum sizes in Bratcher & Cernohorsky (1987) on Terebridae to those in the *Registry*. A particularly striking example is *Terebra funiculata*, 69 mm vs 32.5 mm. This is important to the collector, because world record size specimens often command a premium price. The premium might not be great for a species like *Terebra funiculata*, but how about in the Pleurotomariidae? Anseeuw & Goto (1996) cite the largest *Perotrochus midas* as 127.5 at the American Museum of Natural History, and the holotype as 118.3. The *Registry* lists the world record *P. midas* as 77.4 mm. For nine out of sixteen entries for pleurotomariids in the *Registry*, Anseeuw and Goto list larger specimens (*Perotrochus africanus*, *hirasei*, *lucaya*, *midas*, *pyramus*, *salmiana*, *teramachii*, *vicdani*, *westralis*).

The *Registry* would be much more authoritative if it included record sizes from the literature, and I recommend this be done in future editions. The problem with such literature records of course is that often the repository of the largest specimen is not stated; the authors just give a size range for the species. Still, the *Registry* could have a convention for such cases to state "unknown" for "Repository" and to give the literature citation for the record size under "Reference." Or the *Registry* could give two listings, one for the literature record, and one for the largest record tied directly to a specimen.

I found that there is quite a bit to be learned from maximum sizes. Maximum sizes are one gauge of the range of variation in a species, and can aid in identification. In several cases I concluded that accepted synonymies were probably not true. Our collection lists *Vexillum tumidum* Reeve, 1844, as a synonym of *Vexillum gruneri* Reeve, 1844. We have forty adult specimens of *V. gruneri*, none bigger than the listed record of 30.0 mm. We have 11 specimens of *V. tumidum* larger than 30.0 mm and only one adult smaller. This strongly suggests that they are distinct species (which is fortunate, because *V. tumidum* otherwise has one month priority over *V. gruneri*.) This points out another feature of the *Registry*, that subspecies, varieties and forms often have their own entries. I consider this an advantage, as these infraspecific taxa might someday prove to be full species, and maximum sizes might provide evidence as to their status.

Minimum sizes are also informative, and the *Registry* lists a few minimums for Cypraeidae and Strombidae. This is an area that has been little explored. I would encourage collectors to start submitting minimum size records to the *Registry* in families where it is possible to tell that a small shell is fully adult. You probably have a better chance of getting your name into the *Registry* that way too — less competition!

—Gary Rosenberg

I had an immediate clue that this would be a quality reference because of the good taste required to illustrate *Chicoreus eversoni* on the cover. But more about that later.

There are four main differences between *The Registry of World Record Size Shells* and its predecessor, Wagner & Abbott's *World Size Records* in the *Standard Catalog of Shells*, and all of them are improvements on the Wagner & Abbott work.

1. **Size.** The number of entries has almost doubled, from 2318 to 4470. Bigger is better in this case. Yet the physical size of *The Registry* is only a fraction of the heavy and bulky *Standard Catalog* in which the original *World Size Records* was contained. Also the spiral bound format keeps the page open to where you want it with no hands or bookmark. Smaller is better here.

2. **Measurements.** The entries are in millimeters to the nearest tenth millimeter. The old *World Size Records* was in centimeters. Most collectors use millimeters and, while it is no strain to move a decimal, this format is more comfortable and eliminates the mental translation.

3. **Classification.** *The Standard Catalog World Size Records* and the *Lost Operculum Club List of Champions* (size records for marine shells of the Eastern Pacific from Alaska to Chile) both list alphabetically by genus. The new *Registry* lists alphabetically by family. Example: Conidae. Then *abbas*, *abbotti*, etc. The next

column lists genera. Two examples show that this is better. Imagine a turrid collector (there are a few) looking for records. This is a family with about 679 genera. Now he can scan a couple of pages in a row instead of looking in 679 different locations. Next imagine a collector who just received a dealer's list and wants to check the sizes against world records. Many dealers list *Cassis*, *Cypraea*, *Semicassis*, *Phalium*, etc. under the genus *Cassis* for simplicity. And many lump *Chicoreus* and other muricid genera under *Murex*. In the Registry you can find the intended species immediately instead of looking in other references first to find what the current genus is. And generic names frequently change but species do not. Maybe half of the species in your collection should have a parenthesis around the author and date to indicate that the genus has been changed since it was described. With a little trial and error, I decided on this family and species system for my personal catalog use and, after thirty years, have not found a better way. Perhaps most convincingly, Tucker Abbott had decided to use this system in the next edition of his *World Size Records* as a part of his intent to make the work more educational, but didn't live to fulfill his plan.

4. References. The last column contains a reference with a page number or a plate and figure number. Many times I have acquired a little known species and searched through a dozen books trying to find an illustration or just to verify a dealer's identification. Now, even if I'm not interested in records, I can use the *Registry* to identify a reference on the first try.

The references used in the Registry can pose questions. Why is Cernohorsky's *Marine Shells of the Pacific, Vol. II* listed and not volumes I or III? Alison Kay's *Hawaiian Marine Shells* is listed, but the definitive work on New Zealand shells, *New Zealand Mollusca* by A.W.B. Powell is not included. Many other landmark works by highly respected malacologists are omitted, while articles in periodicals frequently written by amateurs, such as *La Conchiglia* and *American Conchologist*, are.

It would seem the included 49 references were just those used by the authors for this edition. Nor do I see anything in the Introduction or the Record Submission & Verification Form that excludes any reference. So it seems obvious that these references will be expanded in future editions as contributors list them on their entries. However, this should be spelled out. We should not have to guess about this. One or two sentences in the next introduction regarding acceptable references should clarify the question.

I appreciate the time and effort that it took the editors to include a reference for every species. None of the entries I

submitted to the old *World Size Records*, and I'm sure it's true of most others, included a reference, because none was required or requested in the past. This required a great amount of work.

One question the book did not answer was: "Who has the world's largest shell?" The bivalve winner is Victor Dan with a *Kuphus polythalamia* measuring 1,532.0 mm. The family name of Teredinidae was misspelled. The American Museum of Natural History has a *Tridacna gigas* measuring 1,368.7 mm. Finding the largest gastropod was not so easy. I looked for *Syrinx aruanus* in the Turbinellidae but no Turbinellidae was to be found. Where was *Syrinx*? Where were *Turbinella*, and *Columbarium*, *Benthovoluta* and the other genera from Turbinellidae? I found *Syrinx* in Melongenidae and those other genera in Vasidae. This is something else to list in the introduction — whose system of taxonomy are we following?

Now, back to the cover. I was glad to see my namesake shell identified inside the front cover as "*Chicoreus eversoni* D'Attilio, Myers & Shasky, 1987," as this is current taxonomy. Originally described in the genus *Phyllonotus*, which is now considered a subgenus, *eversoni* was assigned to *Chicoreus* (*Phyllonotus*) by Emily Vokes in her most recent interpretation. So, the authors and date should be enclosed in parenthesis denoting a genus change, but they aren't. A minor thing. But in the body of the work, the species *eversoni* is back in the genus *Phyllonotus*, and other *Chicoreus* subgenera such as *Siratus* are still shown as full genera as well. I think this is still a minor point. This book is meant to be a useful, working and evolving tool and should not be nitpicked on details that are not relevant to its purpose. The authors are not producing a treatise on each family with hot-off-the-press reclassifications. I suspect they are following Vaught's classification which has been out for a few years, and is by no means perfect or up-to-date, but is readily available and inexpensive, and thus a good choice. But if so, this standard should be identified in the introduction, so that one knows where to find a shell. Also, typos are found in almost every book, and this is no exception, but they do not lessen the useful information, which is the main reason why we will buy this book. Two thumbs up!

—Gene Everson

Ed. note: The senior author tells us that the next edition of the Registry will attempt to acquire the Lost Operculum Club List of Champions data that has been submitted since the last edition of the publication in 1987, as well as any earlier data that has not been included in the current edition of the *Registry*. This list includes many species under 1", the lower cut-off limit imposed by Wagner & Abbott.

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Do you have trouble finding the Kevan Sunderland centerfolds on the Conidae in old issues of *American Conchologist*? Or those articles Carole Marshall did on the Pectens? You need an index to all those back issues of the *American Conchologist* that you've been accumulating through the years. COA Publications Director Betty Lipe has completed the index for the past five years, volumes 20-24, covering 1992-1996, available for just \$4.00. If the issues you want to consult stretch back before these last five volumes, you can also purchase the 1973-1991 edition for another \$4.00. (The price is lower because it was printed back in 1992.) Both indices are available from Properties Manager Hank Foglino. Write Hank for your copy today. He can be reached at 4 Trent Court, Smithtown, NY 11718-1266.

Starting with 1997, a two-year index will be published as a supplement to the *American Conchologist* biannually. The next two year index will be in the Sept. 1999 issue and will index Volumes 25 and 26 (1997 and 1998).

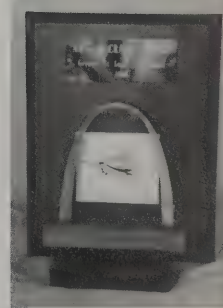
MID-WEST SHELL SHOW

by Kathy Krattli

The Greater St. Louis Shell Club seems to be the only "inland state" club that still has a shell show. We host a show every other year, our next one being April 24-26, 1998. Our show, held in the Chesterfield Mall in Chesterfield, Missouri, is sited in the mall's beautiful central court, surrounded by fountains and plants, indeed a lovely setting. Two hotels are right across Highway 40 from the mall, a Doubletree, and the brand new Hampton Inn.

There are a lot of sights to see in the St. Louis area, our famous St. Louis Zoo, the world renowned Missouri Botanical Gardens, the Arch and Museum of Westward Expansion, the St. Louis Science Center, and the new Cathedral with spectacular mosaic work said to rival the cathedrals in Rome.

Shown above is our own unique little St. Louis Shell Club Trophy, awarded to winners in five different categories, an added enticement perhaps? Come see what the St. Louis Shell Show is all about! You may contact me for added information at 312 Capri Drive, O'Fallon, MO 63366.



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The Brazilian Connection: DO YOU REALLY KNOW ABOUT SHELLS?

by José Coltro

I remember when I started collecting shells thirty years ago. Each January my parents used to take my brother Marcus and me to the beach for our summer vacation (Remember that we Brazilians live in the Southern Hemisphere and we have opposite seasons from the North Hemisphere). We commonly stayed there for five or six weeks. Our usual destination was Santos, just 50 miles from our home in Sao Paulo. There, each morning we walked along the beach looking for shells. We just used to collect dead specimens, most of them fresh-dead ones. Species like *Olivancillaria vesica* (Gmelin, 1791); *Polinices hepaticus* (Röding, 1798); *Sanguinolaria cruenta* (Lightfoot, 1786) and *Tellina punicea* (Born, 1778) were easy to find. At that time we just piled the shells in boxes. But one day one of those boxes started smelling really awful and we didn't know what happened. Over the course of days, I washed all the shells many times. I used all kinds of soaps, and finally I decided to use some of our mother's perfume to extinguish the smell! The result was terrible. My mother sent me to the beach to throw away all the shells and finally there I found the "bad shell" — an alive-taken *Anadara notabilis* (Röding, 1798) was among the hundreds of shells and it died, of course, after some days out of the water. I could not imagine that a single dead shell could smell like that!

Some years later, I was looking for shells in a rocky area and I found my first *Cymatium parthenopeum* (von Salis, 1793) — a dead and crabbed specimen. It was very exciting and we wanted to keep the shell, but I didn't want to kill the poor little animal. Well, I decided to prepare an aquarium to keep the hermit crab alive. For months I took care of the small crab and one day I found a dead crab body on the aquarium floor. Great! I could finally put the shell in my "collection." When I took the shell from the aquarium I sensed a fresh marine odor and I decided to cook the shell to clean it. The crab wasn't dead — it just changed the old skin and I cooked it alive! It was a nasty shock! I didn't know about hermit crabs and their habits. Anyway, I put the shell in the collection.

I normally asked all my relatives and friends to bring shells from their trips. One day, a friend brought me a large *Concholepas concholepas* (Bruguère, 1782) from Chile. My reaction was a little bit disappointed — I told Marcus that I would like to have both valves. I didn't know that this species, resembling an Arcidae valve, is a gastropod and belongs to the Muricidae family.

One day I heard about how to clean shells using microwaves. My mother had just bought a new one. I had a *Turritella exoleta* (L., 1758) with the rest of the animal inside. I had already tried to clean the shell using water and it was impossible. I decided to put the shell in the microwave. It was catastrophic! The terrible odor invaded the entire house. Took over two days to clean the microwave! I didn't know that dead shells could have their odor refreshed by microwaves.

In 1983 Marcus and I finally saw our first shell exhibition. A Brazilian collector, Jose Roberto Heise, did a small exhibition in an aquarium store and we had our first contact with other collectors. In the exhibition Jose Roberto put his gorgeous *Xenophora pallidula* (Reeve, 1843) there. I commented to Marcus that the exhibition had some gorgeous specimens, except those *Xenophora*. How was it possible that a man could take so many gorgeous specimens and attach them on another shell — what a silly thing to do — I didn't know that *Xenophora* attaches shells by itself.

Then there was the time when I had collected my first live cowries: Marcus and I went to Ilhabela and we found many huge *Cypraea zebra* L., 1758. We didn't know how to clean them, so CX.P. 15259, Sao Paulo CEP 01599-970 Brasil.
Email: femorale@br.homes hopping.com.br

we decided to leave the shells in fresh water — we lost all the specimens. We didn't know that fresh water could be really bad for glossy shells.

In 1984, my friend Bernardo Linhares, from Salvador, Bahia, sent his first shell delivery to me. Marcus and I started to clean the shells at our mother's laundry. The task took many days and it started to smell badly. The neighbors started to complain about the odor. So terrible was it that we were expecting to have the police in our house looking for dead bodies — I didn't know that cleaning shells was such a slow process.

In our first trip to Ecuador, I collected some *Purpura pansa* Gould, 1853. I kept the shells on my hand for quite some time. After that my hand was completely purple and smelling really bad. The color and odor took weeks to disappear. I didn't know that some species could dye you!

When we went to Samoa, I told my friend Eduardo Schirrmeister that it is better to keep nerites alive, just drying them, and waiting to clean them at home. I didn't know that he would do that, but besides drying the shells, he put them inside a Gatorade bottle and closed it very tightly. Of course the air inside of the bottle ran out, and the nerites began to die. The gases from the dead animals inside made it a bomb! When he tried to open the bottle, a terrible odor overwhelmed all his room and the hotel. The solution was to open the bottle into the seawater. Even this way, the odor polluted the entire beach! He didn't know that dry nerites need fresh air to stay alive.

As you can see I am learning about shells each day and I can't believe that anybody really understands everything about them. I believe that each experience, even the worst of them, brings us good information, ideas and knowledge. It is very important to keep our minds always open, because not only in shells but also in all the facets of life, each new event teaches us something new.

1997 FALL SHELL SHOWS AND MEETINGS by Donald Dan, COA Award Chairman

- | | | |
|--------------------|---|---------------------|
| Sept. 21-22 | International Shells & Fossils Bourse
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| Sept. 26-28 | Annual German Shell Fair
Schwarzenfeld, Germany
Josef Lingl, Fichtenstrasse 6
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| Sept. 27-28 | Central Florida Shell Show , Orlando, FL
Jake Dominey, 700 Tam O'Shanter Drive
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| Oct. 25-
Nov. 2 | Oregon Shell Show , Portland, OR
Maxine Hale, 347 N.E. 136 Ave.
Portland, OR 97230 | (503) 253-5379 |
| Oct. 25 | British Shell Collectors' Club Shell Show
London, England
Kevin Brown, 12 Grainger Road
Isleworth, Middlesex TW7 6PQ, England | (181) 568-8333 |
| Nov. 1-2 | Philadelphia Shell Show , Philadelphia, PA
Al Schilling, 419 Linden Ave.
Glenside, PA 19038 | (215) 886-5807 |
| Nov. 21-23 | North Carolina Shell Show , Wilmington, NC
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WHY DO WE COLLECT SHELLS?

by Deborah Wills

There I was, thousands of miles from home standing in a crowded reception room one hundred feet above the ground in Seattle's Space Needle, waiting for a napkin. The waiter's eyes had revealed his thoughts when I had asked for that napkin and if the "lids" were in the kitchen, but he said nothing and soon returned with a plastic ziplock bag for my treasures. I only took three, but I wish I had gathered them all. Were these "treasures" trinkets of gold, or silver, or a plundered table decoration? No, they were freshdead oyster shells. Do you wonder why I would want messy, just-emptied oyster shells? Well, depending on my mood, my well-honed response might be "Why not?" or "Because."

As a land-locked lover of shells, I've learned to appreciate shells wherever I can find them, be it in computers, rivers, fabric stores, magazines, the bottom of aquarium tanks, the frozen section of a grocery store, and, yes, even at fancy receptions. The thrill of my latest find was multiplied later that evening when I realized just how recently harvested those oysters had been. Attached to those shells I found a living growth series of mussels (the largest was 1" long), a variety of small, yet fascinating, limpets, and four gastropods only a couple millimeters in length each. Regardless of what else happened on that trip, nothing could compare with how euphoric I felt that night.

When it comes to this compulsion and joy of collecting, I find that I am not alone. There is something in the human spirit that drives us to know more about "what's out there" — whether it be exploring inner space, outer space or cyberspace. And, history has shown us that there is also an inner need to bring something back to remind us of our journey. In a sense, this need to explore and collect may be a subconscious effort to learn more about ourselves. Well, while many of us were satisfying that need to "bring something back" from the COA convention, Andy Rindsberg posed the age old question to COA's electronic discussion group (Conch-L) — "Why do we collect shells?"

This simple question of WHY do we do what we do received responses from around the world. Quoted below are some excerpts from those responses. (For the full discussion, check out the July 15-23, Conch-L archives at: <http://museum.nhm.uga.edu/CONCH-L/CONCH-Larchive.html>)

I collect shells because:

1. Floating face down in tropical waters while snorkeling is one of the most enjoyable of physical and mental exercises. It is never boring, always exciting, and totally relaxing, but with the excitement of a treasure hunt added.
2. I have a tremendous sense of self-satisfaction in seeing just how much of [the shell's] natural (clean) appearance I can restore.
3. They are nature's jewels — the colors, the shapes, they are superb examples of art to be admired and appreciated; therefore, I display them for all to see.
4. Each self-collected shell brings a memory of a good day in my life. Any day you find a shell worth keeping is a good day.
5. I want to pass them down to my grandchildren as works of art.
6. I use them to inspire myself, family and friends, to be creative. . . . My entire home is decorated around the soft pastel shades found in shells.

—Sylvia S. Edwards

The collection, cleaning, curation, and study of shells is to me . . . a means of retaining some sense of sanity in this increasingly hurried and sometimes insane society Shell collecting is a

means of personal growth and satisfaction. I do not want to sound too ethereal here, but it is not just what I do, it is who I am. And I am glad.

—Doug Shelton

I enjoy getting outdoors; finding new collecting sites or rediscovering old ones; listening to the quiet; thinking to myself; singing unheard in the woods. I enjoy seeing the fossils emerge from the sediment, each shell with more detail than could ever be described, each one different, each one once alive and with its own life story.

I enjoy sorting shells into species, and learning which type of juvenile corresponds to which type of adult. I love to examine the drill holes and breakages and encrustations, the myriad accidents that can happen to a shell. I enjoy gathering the references together and that flash of insight when I recognize a shell in an old book. I savor seeing things that have not been recorded, adding a new brick to the edifice of science, knowing that it is new. I enjoy the feeling of continuity with dead and living practitioners of the same art — the sense of community.

And I enjoy the drawers of cleaned shells, neatly labeled, useful for science, meaningful in a way that uncollected shells never are.

—Andy Rindsberg

I enjoy mostly their beauty. There's no price tag on my enjoyment I've had acquiring them.

—Carol Boswell Simpson

. . . You see, shell collecting is an instinctive persuasion. Collecting, like eating and sleeping, is part of being human. We collect . . . because we are human. Each of us must give in to this drive. I have directed my drive to shells and, specifically, the Epitoniidae. It has nothing to do with any will on my part. It is a MUST thing we all experience. Our only free will part in it is what we choose to collect. Shunning any collecting guarantees our DNA to be quite close to Neanderthal.

— Art Weil

I wouldn't be surprised if some day the scientists working on the human genome will find a collecting gene. If you inherit one from your parents, you become a collector; if you get two, you are really in trouble — like some of my friends who collect everything in sight

—John Wolff

Since I miss the sea so much, I started to collect shells as a means to be in touch with it between my dives. While diving I collect shells and back to Brasilia I clean, classify and store them Today, 6 years after starting this hobby, I love shell collecting even more than diving and thanks to Internet and to Conch-L I have many new friends in several countries.

— Eduardo Moreira (Brazil)

[Tucker] Abbott emphasized that conchology is relaxing. "Hobbies are . . . very necessary things for many people, and many depressed, bored or cynical individuals might be satisfied, fulfilled, deeply interested and productive if they had a hobby to use as a medium for self-expression. 'Shells don't talk back to me!' is a statement that I have heard from several professional malacological scientists" [*Kingdom of the Seashell*]. Abbott thought that a collector needs to be a little crazy to spend time with shells, but that shells are great therapy, not the root cause of eccentricity. Sounds true enough to me.

When I am out collecting shells, I feel close to my hunter-gatherer ancestors, and wordless.

—Andy Rindsberg

In my humble opinion there is no greater reverence we can exhibit to the Creator than to collect and cherish and pass on His greatest natural wonders . . .

—Randy

One of my greatest drives is the sense of discovery, finding new taxa, or extending the range or rediscovering lost populations or the first living specimen of a particular species or being able to observe some aspect of the life history/biology of any one species. There is also the sense of being able to look into the past, and sometimes to touch history . . .

I have always been fascinated by the diversity shown by the whole class, not just snails. It never ceases to amaze me just how many habitats that molluscs are found in and goes to show just how successful, as a group, they really are.

Another major drive is that with the skills and knowledge I have I am capable of making real contributions to the total sum of what's known about molluscs and other groups that are directly or indirectly associated with them. . . . They are for me a tremendous way of sparking a sense of wonder in nature, and showing people from the very young to the elderly just how amazing and special the planet and the creatures we share it with really is. . . .

As for why I started collecting I have to blame my father, and a little later my uncle (his elder brother) for they both had a great appreciation of nature.

—Stephanie Clark (Australia)

Some shell collectors can't really define what first got them interested. They "just sort of grew into it." I trace my interest

directly to enjoyable boyhood memories, looking through the drawers of my grandfather's cabinets, trying to find the species in a tattered copy of Webb's Catalog, and especially picking through his many boxes of shell "rejects" and other odds and ends in the room next to the coal bin [in] his dusty old cellar!

—Paul Monfils

The thing is, I've never thought about why I collect. Or what I collect. And if I take this seriously (which I do), it requires a bit, or a lot, of self-analysis . . . examining my own feelings, I wonder if the answer . . . isn't tied up in some way in being able to control our world, rather than having the world control us. We limit or expand our collection as we see fit, we make our own rules of what we collect, we change our mind and so shift our focus to other areas. Those of us who do this merely as a hobby (as I do), identify things as best we can, and no one dares tell us we're wrong. It's close to the best of all possible worlds. We approach perfection as our collection approaches perfection.

So . . . why do I still love doing it? Don't know.

It is the beauty of the world around us, the connection we as humans make with other living things, the search for knowledge, in my case at least, for the sake of knowledge itself, the desire for immortality by finding new species; and the desire to have the young use us as role models, because, after all, aren't we just the greatest people anyway?

—Michael Penziner

I really enjoy the recent lively discussions on CONCH-L about why we collect shells. At least I don't feel that alone on this island.

—CHAN Sow-Yan (Singapore)

Now why do I collect shells? Because . . .

SURVEYING COA

by Rosalie Taylor

More than 400 of you returned the COA survey with your membership renewals. Dave Green, COA President, gave a full report on the results during our annual meeting at the convention at Captiva Island, Florida. It is evident that most of you like the way the conventions are currently being held. Thanks; that makes us feel good. We have certainly taken into consideration all of your comments and suggestions for improvements.

One area we hope all of you can help us with is getting more young people interested in Conchology. Of those who responded we only had five people under the age of 20. The majority of you are 60 or older with the 40 to 60 age group a close second. Some of you have been collecting all your life; however the majority have collected for 20 to 40 years. You love the Bourse, programs and field trips (you'd like more than one field trip and you stipulate they should not conflict with programs.) As to the use of credit cards, you said it was a convenience rather than a necessity.

The overwhelming majority of you prefer the conventions to continue being held during the summer and to last five days, and you would not eliminate any of the regular features of the convention. You love the Bourse, programs and field trips (more than one field trip and you stipulate they should not conflict with programs). As to the use of credit cards, you said it was a convenience rather than a necessity. The majority of you are not interested in having COA maintain a list of members who are looking for convention roommates. However, there is a significant number of you who would like such a list available from which you can choose.

One hundred thirty five of you have never attended a convention. The majority of all respondents said the location was the strongest influence on attending. (The Board of Directors sincerely hopes this number who have never attended will decrease. We did have a lot of first timers at the Captiva convention.)

The drawing for the \$100 prize took place after Dave's report. "And the winner is: Dennis Dworak of Cape Coral, Florida!" Congratulations Dennis!

Thank you for participating in the survey. The Board of Directors has listened to you and we are working to see that the COA is all that you want it to be.

R. TUCKER ABBOTT AWARD AT JACKSONVILLE

The Jacksonville Shell Club proudly announces the creation of the **R. Tucker Abbott Award** which will be presented for the first time at the 1997 Jacksonville Shell Show. The membership unanimously voted to establish this award in memory of this special man who had an abiding relationship with the club and was a close friend of many of its members. Since the club's inception in 1962, Dr. Abbott served as a judge at seven Shell Shows in addition to presenting programs in our local area.

This award, which mirrors the worldwide involvement of its namesake, will be presented to the exhibit that best exemplifies the worldwide and educational interest in shells. Club members hope that this newly created award will keep alive the memory of this unique man who inspired us all. We invite you to attend one of our shows, and to compete for this attractive plaque.

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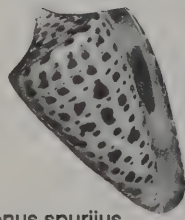
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A RARE CONCHOLOGICAL ODDITY FROM SOUTH AFRICA

by Richard L. Goldberg & Bruno DeBruin

Among the many interesting and unusual species of mollusks that have surfaced in South Africa's Algoa Bay area during the past few years is a new species of Pseudolivinae in the genus *Naudoliva* Kilburn, 1989. *Naudoliva vorsteri* Lussi, 1995, is the second known species of the genus, and is only known from four specimens (three adult and one juvenile). At the time of its description, only two mature live-taken specimens were known.

N. vorsteri should have been described two years earlier than it was. Avid South African diver and marine biologist, Francois Vorster, brought the first and only known specimen to the attention of this article's junior author back in 1993. Using the limited South African and main stream conchological literature to identify the shell was an exercise in futility. So the specimen stayed in the unidentified species drawer of the junior author's shell cabinet and was not given the priority it deserved until two years later when Mr. Vorster surfaced with a second specimen. It was then suggested that the two shells should be examined by Marcus Lussi, an expert in odd and unusual deepwater molluscan species. He immediately recognized that the shell was undescribed and determined that it was the second known species in the genus *Naudoliva*.

Naudoliva vorsteri is apparently endemic to Algoa Bay. Algoa Bay has many sandy beaches and one might expect to find beached, or crabbed specimens washed ashore. Yet it is interesting to note that not even fragments of this species have ever been found by beachcombers. It is even more amazing that it remained undetected by local researchers who have actively trawled, dredged, and scuba dived the area for many years.

The genus *Naudoliva* is most closely related to the Australian genus *Zemira*, based on comparisons of external anatomy of the animals. An unusual feature of this species is the labral denticle on the anterior end of the lip. The denticle is also exhibited by *N. caitlinae* Kilburn, 1989 (figure 2), the type species of the genus. The species is carnivorous and probably uses the labral denticle to help pry open bivalves so that it can insert its proboscis to feed on its prey. Another rare Algoa Bay olive, *Sylvanocochlis ancilla*, has a similar animal to *N. vorsteri* (figure 3). Members of the Olividae are sand and mud dwellers and are often found in colonies. Yet *N. vorsteri* has eluded collectors, even when using accurate GPS readings to return to the few previously known collecting sites.

Its unique and striking color/pattern cannot be confused with any other similar species. The shell was described as medium-sized (about 30mm), bucciniform, relatively thick-shelled with a large body whorl, an ancillid groove, and a labral denticle. The moderately glossy shell has fine shallow spiral sulci, crossed by weak growth lines which produce a rough surface sculpture on the early whorls.

The holotype is a live-taken specimen, measures 26.2mm x 14.5mm (figure 1). The shell was collected in 20-25 meters of water in Algoa Bay. *Naudoliva vorsteri* is named for Mr. Francois Vorster who found and donated the first specimen for study.

Richard Goldberg, P.O. Box 6088, Columbia, MD 21046-6088 Email: Worldwid@erols.com Bruno deBruin, P.O. Box 26912, Hout Bay 7872 South Africa.

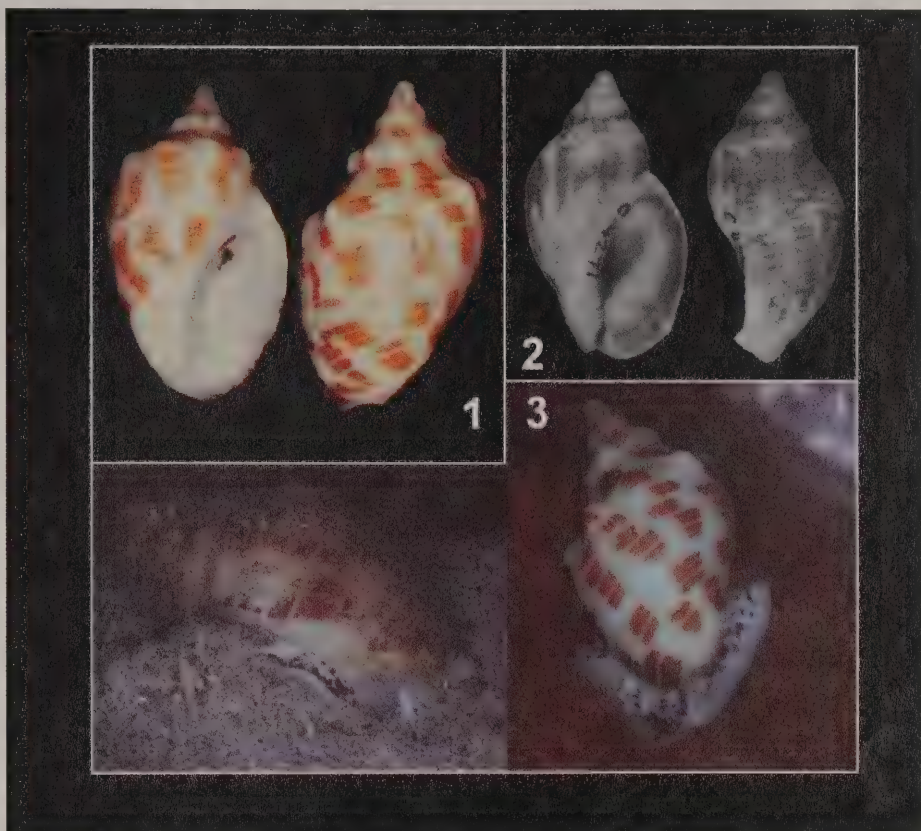


Figure 1: *Naudoliva vorsteri* Lussi, 1992 - Holotype - Algoa Bay, South Africa - 26.2mm Figure 2: *N. caitlinae* Kilburn, 1989 - Holotype - from the continental shelf off Sandy Point, western Transkei, South Africa - 29.8mm Figure 3: *N. vorsteri* - the fourth known specimen, now in the collection of the Academy of Natural Sciences, Philadelphia (Photos 1 & 3 by B. DeBruin)

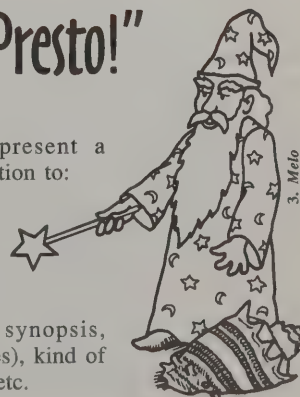
The relatively late-in-coming exploration for mollusks along southern Africa's shores has brought about many exciting discoveries like *Naudoliva vorsteri*. This species still remains a mystery, but will probably not remain unique as new conchological oddities surface in this region.

The Wizard says "Presto!"

Send your application to present a program at the 1998 COA Convention to:

Doris Underwood
698 Sheridan Woods Drive
West Melbourne, FL 32904

Please indicate topic, brief synopsis, running time (ideally 20-25 minutes), kind of equipment needed - slides, video, etc.



BOOK REVIEWS:

Alabama Mollusks: Freshwater Mussels of the Tennessee River near Decatur, Alabama (includes appendices with pictures of other non-marine Alabama mollusks) by Deborah Wills. Privately published, Hartselle, Alabama, 1995. 8.5" x 11" format. Softcover. 100 pages, b/w photographs.

North American freshwater mollusks have been studied for the past 180 years or so, but never as extensively or for the same reasons as they are right now. The much needed and deserved attention is mainly due to the endangered status of the group, in particular the mussels of the families Unionidae and Margaritiferidae. Habitat alteration and degradation have caused the extinction of many species and placed scores of others in jeopardy. At least 15 of the approximately 175 freshwater mussel species and subspecies known from Alabama's inland waters are extinct nationwide, and many others are extirpated from the state and/or are on the federal Endangered Species list.

Identification of freshwater mussels is an inexact science, and even now, mussels are undergoing taxonomic changes based on recent research. The accelerated interest in mussels has created a need for literature which newcomers can use without being intimidated. The basic question arises when one is new to an area: "What's out there?"

For those in northern Alabama, the book, *Freshwater Mussels of the Tennessee River near Decatur, Alabama*, fills that need nicely. Not living in Alabama, and having visited this beautiful state only once, I had to look at a map to see just exactly what area the book encompasses. The Tennessee River is broad in this locality, and it appears there is a lake. The author states in the introduction that the specimens depicted in her book were found within a 2.5 to 3 mile stretch of river in the Decatur area. Also included in the introductory segments are background and reproductive information on freshwater mussels. This is especially valuable for those not well acquainted with the mussels' past and present usefulness and their unusual means of propagation. The discussion under the heading "Identification" is simplified, concise, and easy to understand.

The Decatur mussels are documented in the main portion of the book, of course, which covers 21 species, plus the ubiquitous Asian Clam, *Corbicula fluminea*. Several views are shown for each species, including the variations, common among mussels and confusing to nearly everyone. Commendation must be given here for the high quality of the black and white photographs, especially of the exteriors of the shells. It is difficult indeed to photograph the interiors of mussels when glaring white nacre is involved, but photos where nacre is tinted with color turned out nicely. If I could not identify *Pyganodon grandis*, *Quadrula pustulosa*, *Tritogonia verrucosa*, or any other Decatur mussel using this book, then an eye examination would be in order. The sex of individuals shown is given (where applicable), as are sizes. The lack of shell descriptions detracts little from the usefulness of the book.

After a coverage of the Decatur shells, a basic glossary, accompanying references and suggestions for further reading, one might expect that is the end of it . . . but wait, you're in for a bonus. The subtitle does say, *Alabama Mollusks*. An appendix that at least equals the first section of the book (and perhaps should be part of it somehow) is next. It features freshwater bivalves from other parts of Alabama not necessarily collected by the author. This portion takes in about 39 species, some of which are covered in the previous group. Species that are federally listed are indicated as such. Including and showing these species not only calls attention to their precarious situation, but it also can help prevent a novice from unwittingly (and illegally) picking up a protected species. Many of us never get to see what the shells of these animals look like except in books. Inclusion of examples of shell aberrations (malforms or freaks) alerts the reader to the possibility of encountering these oddities. Care must be taken, though, in assessing what is a "malform" and what is a species or

form we don't recognize. One example, found in the book, is an atypical *Quadrula quadrula*. Recent studies have indicated this is the shell of *Quadrula nobilis* (Conrad, 1854). The author is aware of the recent resurrection of this species, and will likely make a correction when the book is reprinted. Identification of mussels found within an entire state, as opposed to a single area, is admittedly more difficult, but this publication should be of immense help with the species most likely to be found. The author reminds the reader early on that the final decision of a mussel's identity, in some cases, is best left to those with years of experience.

Gastropod enthusiasts will be pleased to learn that yet another appendix appears in the book depicting some of Alabama's freshwater snails. A third appendix examines some terrestrials as well, although many of these are not identified. To me, gastropods are as difficult to identify as bivalves are, if not more so. Most people would not venture so far as to even include them in a publication aimed at mussels. The fact that they are part of the book likely would incline a "mussel person" to think about what other macroinvertebrates are present in the streams and rivers. Overall, you'll get more than you expected when you buy this book. The placement of some of the pictures (with numbers) sideways rather than in a consistent up-and-down format makes handling the pages somewhat cumbersome and might bother me more if I were using it in the field.

More people need to put their research and information into this type of format. Most freshwater books have a limited audience, but it's the enthusiasm that goes into publications like these that take them to unexpected places. I can see *Freshwater Mussels of the Tennessee River near Decatur, Alabama* used as a tool to stir northern Alabamans in the direction of improved awareness of their precious river environment. The rest of us non-Alabamans can appreciate through the pages of this book the fact that many mussel and gastropod species live in very limited geographical areas, and any loss of this wonderful diversity is tragic.

—Karen Couch

In Memoriam

Wayne Stevens
Dorothy Raiehle
Mary "DiDi" Fleischer
Jean Evans
Des Hinton

Dorothy Raiehle
1909-1997

An amateur malacologist who helped to elevate our hobby of shell collecting to its current status, a New York Shell Club member since 1956 and a member of its editorial staff since 1959, Dot was the driving force to keep publishing the *New York Shell Club Notes*. A Long Island Shell Club member since 1975, she was the scientific guiding light and inspiration of our club. Shelling will miss her dearly. —Mel Springer

DISCOVER THE MAGIC - COA '98 - ORLANDO, FLORIDA

by Phyllis Gray & Linda Koestel

The Central Florida Shell Club of Orlando invites you to appear at the 27th Annual COA Convention to be held Sunday, July 19 through Thursday, July 23, 1998, at the Hotel Royal Plaza, Lake Buena Vista, Florida. Orlando is the Number 1 vacation destination in the world!

Central Florida abounds with opportunities of nearby attractions that can be produced at the drop of a hat: Walt Disney World, Sea World of Florida, Universal Studios Florida, the new Orlando Science Center - the largest in the Southeast, Charles Hosmer Morse Museum of American Art and the Orlando Museum of Art for the artistically inclined, Harry P. Leu Botanical Gardens and many parks and preserves for the botanically inspired.

The Hotel Royal Plaza is nestled in the heart of Walt Disney World Village, an easy stroll from Pleasure Island and the Disney Village Marketplace, a world of unique boutiques and entertainment. Hotel guests enjoy complimentary scheduled bus transportation and guaranteed access to all three Disney Theme Parks: Magic Kingdom Park, Disney-MGM Studios, and Epcot.

Grand hotel rooms can accommodate one to four people at \$99 per room (plus tax). The Convention site is located 25 minutes from the Orlando International Airport via Interstate 4 at State Road 535 (Exit #27). Limo service is available.

Discover the Magic of interesting programs, field trips, and other planned events at the Conchologists of America extravaganza. Tentative field trips include A World of Orchids,

Renninger's in Mount Dora (for you antique buffs), choice of Arabian Nights or Sleuths Mystery Dinner Theaters, Cypress Gardens, and a dive trip.

For more information contact Linda Koestel at 1072 Grizzly Ct., Apopka, FL 32712-3059, or phone (407) 880-1176, or email to lkoestel@magicnet.net

Available to clubs on a first-come first served basis is a slide program with a preview of the hotel and some of the trips. To reserve, contact Linda Koestel at the above address and give the date you want to show the slides. The only cost to the club is the postage to receive the slides and script and return to Linda. It is requested that the slides be returned the following day after showing so the program can be sent on to the next club.

Postage costs should run about \$3.50 each way.

Why not bring the family to Orlando next summer. You can enjoy the convention and your spouse and children, if not shell-minded, can enjoy the attractions Orlando has to offer. See You Real Soon!



BOARDTALK...

From **BOBBIE HOUCHIN, COA Treasurer**, 2644 Kings Highway, Louisville, KY 40205-2649:

HELP! HELP! HELP!

Members, I need your help in finding some early COA Convention programs and other COA mementos that you have saved through the years. COA has found someone who has offered to do us a BIG favor by filing for IRS Tax-Exempt Status 501(c)(3) and she needs a variety of COA past-history information from **1982 to 1988**. If this IRS status is achieved, contributions to COA will then be deductible from income tax for donors. So please check among your convention mementos for the following items **from 1982 to the present**:

- (1) Convention booklets with lists of programs, etc.
- (2) Any newspaper article about COA conventions, COA grants, etc.
- (3) Copy of COA's Constitution and By-Laws, especially 1982.

Any of these items you send to me at the above address will be returned to you, **if you so request it**. If you want the items back, please put your name on them and give me a return address. After making copies, we will return the requested items to you. We have copies of the *COA Bulletin* and *American Conchologist* which will be used as resource materials. No photos are needed.

The items you send will be appreciated. Thanks for your help in this search for needed information.

PUBLICATION NOTICES:

The Sanibel Kaleidoscope by Harlan E. Wittkopf. Published by Shell Island Resources, 216 Robinson Drive, Algona, IA 50511. \$12.75 shipped.

Published in February, *The Sanibel Kaleidoscope* pictures over 200 Sanibel shells in full color, "including rarities such as the gold-banded cone and the right-handed lightning whelk." This book focuses on the variations and color forms of the fabled shells of Sanibel Island, presenting the author's ideas and observations about the diversity of color and form in the gastropods he treats. Containing a "tribute to R. Tucker Abbott" and "his last writing to the author, only days before his death," with a foreward written by Dr. Jose Leal, the heavily illustrated little book's profit will go to the Bailey-Matthews Shell Museum.

Missouri Aquatic Snails by Shi-Kuei Wu, Ronald D. Oesch, and Mark E. Gordon

Here's something for unio people who are also interested in aquatic snails. The Missouri Department of Conservation has just published "Missouri Aquatic Snails." The authors are Shi-Kuei Wu, Ronald D. Oesch, and Mark E. Gordon. It covers 56 species known from Missouri, with text and maps. The line drawings were made by Dr. Wu, and the cover was done by Karen Couch. Copies of this softcover, 97-page book are available without cost from: Missouri Department of Conservation, Natural History Section, P. O. Box 180, Jefferson City, Missouri 65102-0810.

This message appears with the permission of the Missouri Dept. of Conservation

CONCHATENATIONS: What's the good name?

by Gary Rosenberg

18. Teramachia

In the June *Conchatenations* I discussed how to track down literature where mollusks were named. Once the publications are in hand, one must be able to determine if a name is *available*, that is properly published according to the rules of the International Commission on Zoological Nomenclature (ICZN), and if it is *valid*, the correct name for a taxon. First I'll consider availability of names.

For an ink-on-paper work to be considered published, it must be issued publicly for permanent scientific record; it must have been obtainable free of charge or for purchase at the time it was first issued; and it must have been produced in an edition of numerous, identical, simultaneously obtainable copies. Names that do not fulfill these criteria are *manuscript names* and are not available, for example, new species names proposed in an unpublished thesis. Also, names cannot be made available by electronic publication, such as World Wide Web pages on Internet, or CD-ROM.

The combination of a generic and a specific name is called a *species name*. *Conus gloriamaris* is a species name, *Conus* a generic name and *gloriamaris* a specific (or trivial) name. Specific and subspecific names together are called "species-group" names. For a species-group name to be available, it must be binominal and spelled in Latin letters. *Binominal* means having a two part name containing *generic* and *specific* names. Subgeneric names are allowed to intervene between the generic and specific names. Trinominal names are allowed in the case of subspecies. If a hyphenated or compound word is used as a species-group name, the hyphen or space is eliminated and the parts of the word fused (e.g., "gloria-maris" becomes "gloriamaris").

Names below the subspecies level (*infrasubspecific* names) are not available. All varietal and form names introduced after 1960 are *infrasubspecific*, by ICZN rule. Varietal and form names introduced before 1961 are interpreted as subspecies names unless the author's intent was clearly *infrasubspecific*. Sometimes intent is obvious, for example, this monster of a name: *Littorina saxatilis rudis* var. *rudissima* var. *aurantia* Dautzenberg & Fischer, 1912. Here "aurantia" and "rudissima" are obviously *infrasubspecific*. In other cases, *infrasubspecific* intent is inferred when an author ignores homonymy by applying the same form or varietal name to congeneric species in the same paper, e.g., *Anachis costulata* var. *major* Locard, 1897 and *Anachis haliaceti* var. *major* Locard, 1897. A third type of *infrasubspecific* name is illustrated by the following pair: *Voluta ancilla typica* Lahille, 1895 and *Voluta ancilla ponderosa* Lahille, 1895. By the former name Lahille meant *Voluta ancilla ancilla*, but the convention of *nominotypical* subspecies name had not yet been established. This might also happen with names like "normalis" and "genuina." Also not available are names introduced explicitly for teratologies (monstrosities) and hybrids. If the author did not know that he was naming a teratological or hybrid specimen, then the name is available.

A name must also be accompanied by some means of identifying it, either a description or an illustration or a reference thereto for names published before 1931; or, after 1930, a description that states characters thought to differentiate the taxon, or a reference to such a statement. That is, before 1931, linkage to either a description or picture is sufficient to name a species; after 1930, a description must be present or referred to. A name that does not fulfill these criteria is a "nude name" (*nomen nudum* in Latin) and is not available. (Currently, the rules of zoological nomenclature recommend but do not require a picture to name a species!)

Why so much emphasis on determining whether names are available? Because names that are not available cannot be valid names and they cannot preoccupy other names. So, unless one is

doing a complete nomenclatural review of a group, names that are unavailable can be disregarded as historical curiosities.

Next, from the set of available names, one must determine which names apply to which species. I will assume that one has a good grasp of the species itself, that is, one has identified the object in nature and is trying to determine its correct name. Sometimes careful study of original descriptions and illustrations is sufficient to determine what species a name refers to. In other cases one must track down type specimens in order to see what species an author meant. (Types are the original specimens on which a species or subspecies name was based.) A name that cannot be identified, usually because the type material is lost or in poor condition, is a dubious name (*nomen dubium* in Latin).

Once having determined which names apply to a particular species, one has identified a set of *synonyms*. Synonyms are names thought to apply to the same taxon. For species-group names, *objective synonyms* are based on the same type specimen, so the synonymy is a fact; *subjective synonyms* are based on different type specimens, so the synonymy is an opinion that the type specimens belong to the same species. For genus-group names, objective synonyms have the same type species, subjective synonyms have different type species.

From a set of synonyms, the correct name is usually the oldest name—the *senior synonym*. This name is said to have *priority*. The other names are *junior synonyms*. Exceptions to the rule of priority are made when a junior synonym is so widely used that it would threaten the stability of nomenclature to resurrect an unused senior name, and in cases of homonymy.

Homonyms are identical names. For genus-group names to be homonyms, they must be identical, letter for letter. Species-group names that have the same derivation can have minor phonetic differences and still be homonyms, for example *Helix sulfurea* Hombron & Jacquinot, 1841 and *Helix sulphurea* C. B. Adams, 1849 are homonyms. *Senior homonym* refers to the name introduced first, *junior homonym* to the one named later; the later name is said to be *preoccupied*.

Primary homonyms are identical species-group names first introduced in the same genus. For example, *Mitra gracilis* Reeve, 1844 is a primary homonym of *Mitra gracilis* Lea, 1841. A junior primary homonym is permanently invalid, so Cernohorsky replaced *Mitra gracilis* Reeve with *Cancilla gloriola* Cernohorsky, 1970. *Secondary homonyms* were named in different genera, but later came to be classified in the same genus. If a junior secondary homonym was replaced before 1961 it is permanently invalid; if it was replaced after 1960 it is reinstated if the species are no longer considered congeneric. For example, *Pustularia mariae* Schilder, 1927 is usually classified as *Cypraea mariae*, which is a secondary homonym of *Cypraea camelopardalis* var. *mariae* Schilder, 1924. The name *Cypraea mariae* was replaced by *Cypraea mantellum* Walls & Burgess, 1980. *Cypraea mantellum* is the valid name for the species if it is placed in the genus *Cypraea*. Because the name was replaced after 1960, if it is placed elsewhere than *Cypraea*, however, the name reverts: thus Lorenz and Hubert (1993) correctly use the name *Annepona mariae*. The name *Cypraea mariae* must not be used.

The concepts of *valid* and *available* are often confused. A valid name is the correct name for a taxon. Many names that are available (i.e. properly published) are invalid because they are junior homonyms or junior synonyms. Usually one can decide objectively whether a name is available, but whether a name is valid is more subjective, because it can depend on the current state of knowledge, and whether one is a lumpers or a splitter. Among available names, junior primary homonyms and junior objective synonyms are permanently invalid—they will always be

homonyms or synonyms. Junior secondary homonyms and junior subjective synonyms are invalid, but might become valid if ideas of classification change.

Note that the *current* name for a taxon is not necessarily valid. For example, *Cochlespira elegans* (Dall, 1881), a turrid from Florida, is a current name, but it is not a valid name. Dall named the species as *Pleurotoma (Ancistrosyrinx) elegans*. The name is preoccupied by *Pleurotoma elegans* DeFrance, 1826 (and also de Blainville, 1829, Scacchi, 1835, Melleville, 1843 and Emmons, 1858). So why did I use *Cochlespira elegans* in my *Encyclopedia of Seashells*? Because no other name is available for the species, and my book wasn't the place to fix the problem.

Note that a species can have more than one valid name, because different authors can place it in different genera. *Cypraea aurantium* and *Lyncina aurantium* are both valid names for the Golden Cowrie, and *Cypraea mantellum* and *Annepona mariae* are both valid names for Marie's Cowrie. Only one name, however, can be valid for a species in a given system of classification. The rules of nomenclature allow one to determine the correct name for a particular species given the current state of knowledge and one's own beliefs about classification.

Because of the rule of priority for synonyms and homonyms, it is essential to know the correct date of publication for names. One often finds discrepancies of a year or two in the year cited for publication, particularly for names from the 19th century. Such discrepancies usually arise because the date on the title page of a journal or book is not the true date when a name was published. For example, in the 1850's the *Proceedings of the Zoological Society of London* ran as much as three years behind. The *Proceedings* for 1851 were published in three parts, one each in 1852, 1853, and 1854. In other cases, works were issued in parts, and the title page bears the date of issue of the last part. Often, external sources must be consulted to determine the true date of publication of particular pages on which species names appear. Evidence for dates of publication is most often found in the records of receipts in libraries.

Among the bibliographic sources cited in my previous column, Sherborn's *Index Animalium* is extremely reliable for dates of publication, as Sherborn intensively researched external sources of information and gives month of publication if known. Ruhoff's work is unreliable for dates, as she generally ignored external evidence. Goto & Poppe, being based on secondary sources, is not reliable for establishing true dates of publication. Knowing the true date of publication of a name is not merely an academic exercise: if two synonymous names were published in the same year, the one published first, even if by a single day, has priority.

CALCIUM SOUP? — A Short Internet Thread

The list's perennial cattle. . .uhh, pig. . . prod, Art Weil asked:

Now I know you won't believe this, but I have a serious question. In driving through Kentucky (and a lot of other places), one is impressed by the millions of tons of limestone that make up the Ordovician, Silurian, and Devonian deposits. At one time, it seems to me that all that lime must have been in some liquid state. I wonder if anyone has done any speculating on the chemical differences that must have made up ancient seas. There's still enough lime around to solidify into all our shells — collected or not — and to form whitish deposits around our pipes. (hard water). What would the seas have been like before the deposits?

This time Andy Rindsberg, Curator of the Paleontological Collection, Geological Survey of Alabama took Art's challenge:

Yes, if "dissolved in water" constitutes a liquid state. (I must admit that the idea of molten limestone engaged me for a few seconds.) Seawater is virtually saturated with regard to calcium carbonate in the tropics, but not in colder water (i.e., warm water can hold more). It doesn't take much for calcium carbonate to precipitate in warm water. In cold or deep or fresh water, mollusks have the harder task of keeping their shells from dissolving. This is why so many cold-water species

Know Your Volutidae

Another of Betty Hunter's delightful legacy of shell quizzes, this one to vex the volutophiles among us, and of course those of you who are generalists or puzzle addicts. Go for it! Answers in December. To enrich the game a little, we have removed Betty's generic assignments. These are available scattered elsewhere in the magazine, as clues...if you can find them.

1. What species names the most warlike city-state of Ancient Greece?
2. What species might be the son of a young man or shepherd?
3. What species names a great British statesman and great poet, second only to Shakespeare.
4. What species suggests sounds you never want to hear from the engine of your car.
5. What species is one whose presence in one's home is without permission, invitation, or welcome?
6. What species strongly suggests a woodsman who brings home game for food?
7. What two volutes are noted as makers of medical supplies and baby products?
8. What species sounds like one who would cultivate a plot of ground?
9. What species is perplexed and filled with misgivings?
10. What species names a basic part of a plant or animal cell?
11. What species needs to call the fire department immediately?
12. What species suggests a sportsman who uses a bow and arrow?
13. What species describes a large, two-handled storage jar used in Ancient Greece?
14. What species suggests a statement which seems contradictory but may be true?
15. What species suggests a driver who travels only after dusk and before dawn?
16. What species suggests the part of a ship which a seaman would approach if ordered to go aft?
17. What species suggests a person who might be called a second Socrates or one of the Magi?
18. What species mentions a human bone?
19. What species has the same name as a certain murderous cetacean?
20. What species might be expected to work with a loom all day?

have a thick periostracum.

It is not a coincidence that seawater is almost saturated with calcium carbonate. The rivers of the world flow into the sea, and yet the sea is not full. In fact, the majority of the seafloor is covered with calcium carbonate. A deeper question is why the sea is not saturated with all the salts, including sodium chloride. Salts are removed by living organisms for their shells, clays change composition as they pass from river water to seawater and take up sodium, and so on. And plate-tectonic movements convey seafloor sediments to the mantle, where they are recycled to the surface by way of volcanoes.

The ocean is a fairly well buffered solution, which means if you add or take away a lot of one kind of salt, the mix doesn't change much until you pass a threshold. Then, things start to change dramatically and rocks start to dissolve, or salts precipitate, until a new balance is reached. Now, evidence for the ancient ocean's composition is not easy to come by, but it has been deduced for some past time frames, and it looks as though the ocean's composition has stayed remarkably constant for half a billion years.

The exceptions were disastrous for life. People have been speculating that the asteroid that hit the earth at the end of the

(Continued on page 30)

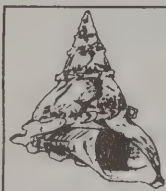
(Continued from page 29)

Cretaceous changed the composition of the upper few hundred feet of the ocean for a few hundred thousand years. If the tropical ocean were suddenly no longer saturated with regard to calcium carbonate, how many species of mollusks could survive? Wouldn't the cold/deep/freshwater mollusks have an easier time coping with the problem, since they're used to it already? Would they repopulate the ocean from their ranks? Speculations like these are rife in the paleontological community.

Hard water occurs where ground or surface water has dissolved calcium or magnesium carbonate from the rocks. Some of that will end up in the sea, but some will be precipitated in the pores of other rocks.

What would the seas have been like before the deposits? If you want to take it back before shelled organisms were common, the seas were very different indeed. It looks as though shelled life appeared as a result of increasing oxygen levels, for starters. But that would require another long answer and I'll let someone else handle it.

Andrew K. Rindsberg, P.O. Box 0, Tuscaloosa, AL 35486-9780
arindsberg@ogb.gsa.tuscaloosa.al.us



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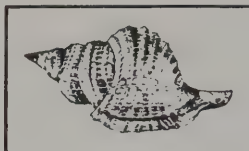
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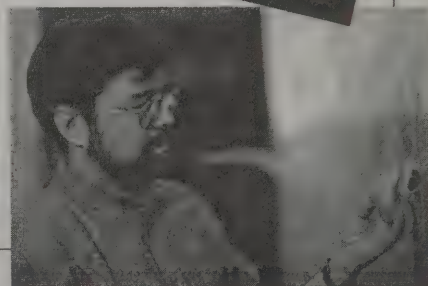
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COA GRANT RECIPIENTS FOR 1997

Congratulations to recipients of the 1997 Conchologists of America Grants. The Grants Committee, consisting of Grants Director Gary Rosenberg, G. Thomas Watters and Henry Chaney, received 36 proposals from 18 states and 4 countries for a total of \$44,881. The committee has selected, with approval of the COA Board of Directors, nine proposals for a total of \$5,700. The 1997 Walter Sage Memorial Grant Recipient is Guido Pastorino. The 1997 Grants Recipients are:

James E. Byers, University of California, Santa Barbara, "Toward a mechanistic understanding of the resistance of a native snail to invasion by an exotic competitor" \$700.00.

Matthew Campbell, University of North Carolina-Chapel Hill, NC "A new look at the Pliocene marine molluscan faunas from the Atlantic Coastal Plain of North America" \$800.00.

Seth J. Lambiase, University of North Carolina, "Life history strategies and population ecology of terrestrial mollusca in southern Appalachian spruce-fir forests" \$400.00.

Michele G. Legé, University of California, Davis, "Ecology of Maya applesnail (*Pomacea flagellata*): a keystone species in marshes of northern Belize" \$650.00.

David B. Lewis, University of Wisconsin-Madison, "A multi-scale investigation of the roles of regional and local factors in assembling freshwater snail communities" \$450.00.

Guido Pastorino of Argentina, National Museum of Natural History, Washington DC, "The genus *Trophon* Montfort, 1810 (Gastropoda: Muricidae) and allied groups from Antarctica and surrounding islands: a comparative systematic study" \$700.00.

Dina Proestou, University of Rhode Island, "Quantifying reproductive success and predicting time of sex change in the slipper limpet, *Crepidula fornicata*" \$800.00.

Donna M. Surge, University of Arizona, "Paleoecology and geochemistry of bivalve shells: implications for pre-disturbance environmental conditions of three estuaries, southwestern Florida" \$700.00.

Brian T. Watson, Virginia Polytechnic Institute, "Utilization of induced infestation and genetic techniques for the determination of host fishes for mussels: emphasis on federally endangered species" \$500.00.

THE WALTER SAGE FUND

Every year, COA awards more grants in support of malacology in the Americas than all other malacological and conchological sources combined. Our Grants to Malacology help many scientists, especially graduate students, and shell clubs with their research projects. Since the grants program was started in 1985, grants have been funded by proceeds from the annual convention, particularly the Annual Auction. But as the need for these grants increases, our income to support them does not increase at the same pace. Requests for funds in 1997 totalled more than \$44,000, but only \$5,700 was available for awards.

One solution has been to institute an endowed fund for grants. Last year, COA's first effort toward such a goal, the Walter Sage Memorial Fund, granted its first Walter Sage Award to Dr. Ross W. Gundersen and Mr. Russell Minton, Department of Biological Sciences, University of Wisconsin-Parkside, for a study on color patterns, "Do stripes equal spots: *Puperita pupa* and *Puperita tristis*." We hope to see a report on that research in a future issue.

At the 1997 Convention in Captiva, COA bestowed its second Walter Sage Award upon Guido Pastorino of Argentina, currently working at the National Museum of Natural History, Washington DC. For his research project, "The genus *Trophon* Montfort, 1810 (Gastropoda: Muricidae) and allied groups from Antarctica and surrounding islands: a comparative systematic study," Dr. Pastorino

was awarded \$700.00.

The Walter Sage Memorial Fund was begun in 1995, shortly after Walter's untimely death from cancer. This very important fund is increasing from two sources. The first is the sales of Walter's fabric collection, generously donated by his family toward this cause. The second is donations from Walter's friends and admirers, and those interested in furthering COA's ability to award scholarships and grants.

The COA board voted this year to henceforth spend only interest from the Sage Fund, using half of the annual interest for the Walter Sage Award, and reinvesting half of the interest in the fund. After paying this year's grant to Dr. Pastorino the fund will stand at approximately \$11,230.00, including money from donations and sale of fabric. But the fabric is a finite resource, and much of the future growth of this endowment will have to come from private donations.

Should you wish to contribute to this worthy cause, in memory of Walter or a relative, or as a charitable contribution at year's end, your gift will be fully tax deductible. Do not send money to COA. Instead, make your check payable to The Academy of Natural Sciences of Philadelphia and send it, along with a cover letter of explanation that it is to be credited to the Walter Sage Memorial Fund, to our Grants Director, Dr. Gary Rosenberg, Department of Malacology, Academy of Natural Sciences, 1900 Benjamin Franklin Parkway, Philadelphia, PA 19103-1195.

LETTERS:

I am interested in exchanging shells with collector(s) in the Washington or British Columbia area. I am looking for cold water muricids and other shells from that area. I have traded for over 20 years and I have a world-wide list of extra shells, mostly self-collected.

J.M. Inchaustegui

464 W. Beach Blvd, Long Beach, MS 39560

The COA 1997 convention at Captiva, FL is now a memory. The participants came, enjoyed the events and all returned home. Anne Joffe, convention chairman, and all the people who helped her plan and host the silver anniversary convention can be very proud of a job well done. . . .

There is one event that took place during this past convention that I feel compelled to comment on. At the 1997 COA general board meeting, President Dave Green presented each of his officers and committee chairs with plaques as a token of his regard for the hard work they had done during the previous year. As the appointed liaison for the Lambis group, I was included in this group of recipients. Although the award has my name on it, it was actually earned by not just myself but by the group of people who I had the honor to represent, the Lambis group. This diverse and talented group of people have given hundreds of hours of their time to the development and maintenance of the COA internet projects (Conch-L and Conch-Net). I would like to remind you of all the people responsible for the COA internet projects.

Lambis 1996-97 members, listed alphabetically:

Linda Brunner	Bret Raines
John Caldeira	Gary Rosenberg
Amy Lyn Edwards	Lynn McLaughlin Scheu
Emilio Garcia	Tom Watters
Richard Goldberg	Deborah R. Wills
Linda Koestel	

I am very proud of the growth of COA's internet presences and would urge all of you to make the most of this wonderful communication opportunity. Tell your friends and acquaintances about Conch-L and Conch-Net, and more importantly, tell us what you like and don't like; what you think would make them better. I have enjoyed my small part in the development of our internet projects, and eagerly look forward to watching them continue to grow.

Amy Edwards

Board Liaison for Lambis Group, Athens, GA

NEW DISCOVERIES FROM THE BRAZILIAN COAST

by Jose Coltro, Jr.

Last June, my friend and diver, Alfredo Bodart, was in South Bahia State, Brazil, looking for shells. He went there to dive some reefs that are distant from the coast — between 30 and 50 miles. Those reefs are in sea mount peaks and they have a very unique fauna. He discovered in very shallow water a few specimens of a new red *Conus* that the Brazilian biologists Paulo M.S. Costa and Luiz R. Simoni are studying right now. He also found three specimens of another species, a gorgeous new marginellid; it is being studied by another Brazilian biologist, Paulino J.S. de Souza, Jr. Both works will be published very soon. Also while there, Alfredo found another *Conus*, huge and gorgeous: a single specimen of *Conus riosi* Petuch, 1986. The shell was trawled at 50-60 meters and was found in the possession of a local fisherman. For many years this species was considered only a variation of *Conus centurio* Born, 1778, but it is now considered a valid species.

CX.P. 15259, Sao Paulo CEP 01599-970 Brasil. Email: femorale@br.homesshopping.com.br



Conus sp. 40 miles off Alcobaça, Bahia, Brazil, in sand, 1-2m. 21mm.



Bullata sp. 40 miles off Alcobaça, Bahia, Brazil, in sand, 1-2m. 25.4mm.



Conus riosi Petuch, 1986, off north Vitoria, Espirito Santo State. Trawled at 40-50m. 67.8mm.

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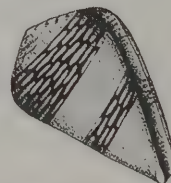
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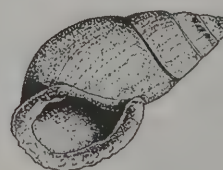
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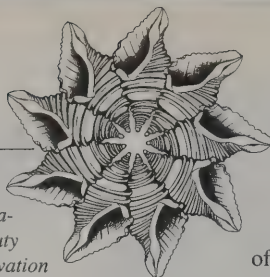
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VOL. 25, NO. 4

DECEMBER 1997

CONCHOLOGISTS



OF AMERICA, INC.

VOL. 25, No. 4, December 1997

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: *Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.*

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MEMBERSHIP

Memberships are for the calendar year, January-December, late memberships retroactive to January. **1998 BASIC DUES:** \$20.00 (USA Bulk Mail, Canada, and Mexico only). **Postal Surcharges:** Other Western Hemisphere nations add \$10.00; Europe add \$12.00; Asia, Africa and Pacific Rim add \$15.00. USA members wishing First Class delivery add \$5.00. Please pay in U.S. dollars, or on check with Transit Enrouting and Account Numbers printed at the bottom, or with money order; make checks payable to CONCHOLOGISTS OF AMERICA. **All Dues Payable To:** Lucille Green, MEMBERSHIP DIRECTOR. **BACK ISSUES** are available from PROPERTIES DIRECTOR Hank Foglino, 4 Trent Court, Smithtown, NY 11787-1266. Prior to 1985 \$3.00 each; 1985 to current \$5.00 each.

PRESIDENT'S MESSAGE

Time passes so quickly in our age of modern technology. If you are like me, your daily schedule is so busy that often many tasks and projects have to be put aside for another day. It is hard to believe that it has been almost five months since our meeting on Captiva Island, and now, preparations are being made for Orlando in July of 1998. I sincerely hope you are making plans to join all your COA friends at Disney World next summer.

For 25 years, COA has been a rapidly growing organization. One of the major reasons for this rapid growth has been member interest and attendance at our annual convention. One of the major problems that faces me as your President is selecting sites for future COA Conventions. As of now, COA has not received any bids for the 1999 Convention. Any shell club interested in hosting the 1999 Convention should contact me immediately for the convention planning guide. Written bids from interested clubs should be received as soon as possible so that the COA Board of Directors can evaluate and vote on the proposals. I welcome all inquiries concerning hosting a COA Convention.

As you read this issue of the *American Conchologist*, I would like to wish you a very Happy Holiday Season and Prosperous New Year.

Dave Green

Editorial

As the 1997 Holiday season approaches, our thoughts turn to friends and family, and holiday gifts to express our love and appreciation. This year, *American Conchologist* — and COA — make a gift of our own: our color budget for the December issue of *American Conchologist*. Those unspent funds will be given to two branches of our organization that reach out beyond our membership to educate the world about mollusks. The first gift, of \$1,500, goes to our Grants to Malacology program, which funds the work of scientists studying mollusks. As costs increase, so do the number of worthy scholars applying for assistance. COA is hard put to find the funds for all the deserving grant applications received.

Our second gift, the remainder of our December color budget, goes to the Lambis Group to cover costs for illustrations in our immensely successful webpage on the Internet, The Conchologist's Network, or "Conch-Net." Since its inception in late June, 1996, The Conch-Net has been visited over 17,000 times. If you haven't been there lately, have a peek. Richard Goldberg has recently put up 19 excellent new color photos of land shells in "The Shells" section. But such digital photos get expensive, so this gift is to fund such additions to the COA face that meets the outside world, the Conch-Net.

As a consequence of our holiday gift, you will see no color in this issue. Instead, we have concentrated on colorful topics which we hope will please you, including another of those fascinating John Timmerman covers, absent too long from our publication.

Last issue for 1997.

Please pay your 1997 COA Dues NOW.

COVER: We are delighted to have another of *American Conchologist* Art Director John Timmerman's fascinating drawings for the December cover. This lovingly-worked study of *Turbo marmoratus* Linne, 1758 vividly exhibits John's hallmark: his fascination with the lines, the textures and the shadows of a shell and an exploration of its moods. Depicted in Japanese ink with brush, the Turbo was collected by a diver working at 40-50 feet among reef rubble below the outer drop-off of the reef flat, Boac, Marinduque, Philippines. John may be reached at 206 Quail Ridge Road, Wilmington, NC 28409-2637. Phone 910-452-0943



COA

July 19-23, 1998

by Lawrence Stiles

Let us slip you a Mickey... Mickey Mouse, that is!

Have we got a deal for you... A COA Convention and Disney World, too! And there's more: Universal Studios (15 minutes away), Sea World (10 minutes away), Lake Buena Vista shopping, and Orlando attractions such as Church Street Station

Complex, and the new Orlando Science Center (kids of all ages will love the planetarium and virtual reality exhibits).

But you still need salt water, you say? The Atlantic Ocean and Cape Canaveral are approximately 55 and 75 miles away respectively, and the Gulf of Mexico is about 95 miles distant. All this PLUS the COA Convention with its fellow shell enthusiasts, bourse, auctions and programs!

CONVENTION CENTRAL: Hotel Royal Plaza, nestled in the heart of Disney property and an official hotel of Walt Disney World. It is located at 1905 Hotel Plaza Blvd., Lake Buena Vista, FL, 32830-2203. Orlando International Airport is just 25 minutes away. There is also guaranteed access and free continuous transportation to all the Disney theme parks.

ROOM RATES and INFORMATION: Group room rates for the convention are:

\$99.00 per night + tax (1-4 people) for either a Standard Room with 2 double beds or a room with 1 king size bed (both type rooms have a love-seat that opens into a single bed).

\$155.00 per night + tax for the Executive King Suite (a bedroom with a king size bed and a sitting room with a sofa opening into a double bed).

Each room is equipped with a 25" stereo TV, a video cassette player, safe, hair dryer, data port telephone, mini-bar, coffee maker, and a

private sitting area. Complimentary cribs may be requested. All rooms are newly decorated with private balconies. There are four lighted tennis courts available and preferred tee times are given at all five Disney golf courses. A Disney Gift Shop is located in the hotel.

These rates will be available three days prior and three days after the convention, based on availability. CUT OFF DATE for reservations at these rates is June 10, 1998. After this date discounted rates are subject to availability. Use COA Discount Code: # 2306. The first night's deposit plus tax holds the rooms. To make reservations: Call 1-800-248-7890 (USA & Canada); overseas attendees call 407-828-2828; FAX: 407-827-6338.

PROGRAMS: Volunteers who wish to give programs should send resumes to: Program Chairperson, Doris Underwood, 698 Sheridan Woods Dr., West Melbourne, FL 32904-3302. Share your shelling experiences with us. Please include your method of presentation, title, etc...

AUCTION: Auction donations, raffle items and door prizes should be sent to Auction Chairperson, Dave Green, 12307 Laneview Dr., Houston, TX 77070-2443.

BOURSE: Anyone interested in participating as a dealer at the bourse should contact Bourse Chairperson, Sharon Snyder, 2015 Vivada St., Orlando, FL 32803. Remember, you must be a COA member for at least six months before the convention to be a dealer at the bourse.

BRINGING CHILDREN? We would like to plan children's workshops during COA program times, so parents or grand-parents can drop the youngsters off at the workshops. However, we need to know if there will be enough young people attending and whether they would be interested in some form of workshop activity. If so, we need to know how many, their ages, and topic suggestions. send this information to: KIDS, c/o Linda Koestel at the address below. **DEADLINE:** February 1, 1998.

FIELD TRIPS: Pre-convention trips include an antiquing foray to Ft. Pierce, or a trip to A World of Orchids. During the convention there will be a choice of an evening dinner trip to either Arabian Nights or Steeples Mystery Dinner Theater. Post convention there will be a trip to Cypress Gardens or a scuba trip off the east coast of Florida. There is still time to send field trip suggestions to Linda Koestel, 1072 Grizzly Ct., Apopka, FL 32712-3059.

COA MEMBERSHIP CHANGES FOR 1998

We regret that the 1998 membership dues for Canadian and Mexican members of the Conchologists of America will require an additional \$5.00 postal charge. In 1998, COA will also offer memberships mailed to addresses within the USA the option of paying an additional \$5.00 postage for First Class Mailing.

MAILING OPTIONS (choose one):

1998 COA membership dues are \$20.00 PER MEMBERSHIP plus an additional postage charge.

(Type of membership may be Individual, Family/Household, or Organization.)

*USA Bulk Mail [\$20.00 dues + no additional postage]	= \$20.00 Total
*USA First Class [\$20.00 dues + \$5.00 postage]	= \$25.00 Total
*Canada and Mexico [\$20.00 dues + \$5.00 postage]	= \$25.00 Total
*Western Hemisphere (outside the USA, Canada, and Mexico)	
[\$20.00 dues + \$10.00 postage] =	\$30.00 Total
*Europe [\$20.00 dues + \$12.00 postage]	= \$32.00 Total
*All Others [\$20.00 dues + \$15.00 postage]	= \$35.00 Total

For all address changes, new memberships, renewal memberships, or additional membership information contact:

Lucille Green
COA Membership Director
12307 Laneview Drive
Houston, TX 77070-2443 USA

MUSEUM LIBRARY Auction Items Needed for 1998 Convention

Before we know it, it will be July and we'll all be in Orlando, Florida, celebrating the 27th Annual COA Convention. As auction chairpersons, we are asking COA members and dealers to please donate quality specimen shells for the oral auction, silent auction, door prizes and raffle. Shell books, shell art, shell photography, coral specimens, and other shell-related items will be greatly appreciated. Although the convention is still six months away, it is never too early to send your donations to:

Dave and Lucille Green
12307 Laneview Drive
Houston, TX 77070-2443

Thank you for all your help and cooperation in helping next year's auction be the biggest and best yet. If you have any questions or comments, please contact Dave or Lucille Green, Auction Chairpersons at 281-376-5630.

Don't forget that auction proceeds are used to fund our COA Educational Grants program! Please have your donations to the Greens by May 1, 1998.

A Century-old Dispute Revisited

by Richard E. Petit
drawings by Charlotte Lloyd

In the older molluscan journals there is a history of disputes between authors being continued from issue to issue, replete with claims, rebuttals, counter claims, and all manner of riposte. Scientific journals, such as *The Nautilus*, no longer permit this except in very rare instances (and even then do not allow prolonged feuds), but the genre continues in some newsletters and popular publications.

The protagonists in the episode under discussion are John Ford (1827-1919), a Philadelphia banker and conchologist, and Edgar A. Smith (1847-1916), curator of mollusks at the British Museum (Natural History).

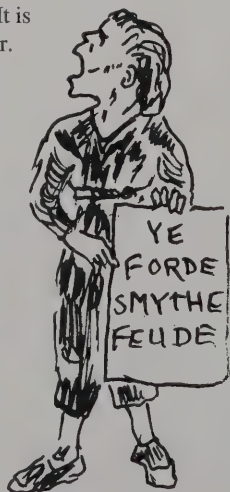
Our story opens in 1893 when Ford (1893a) described a new variety of *Cypraea* as "*Cypraea cruenta* Gmel. var. *Greegori* n.var." Later he wrote another article (1893b) in which he raised his variety to the species level and in which he remarked upon prior treatment of the species. Here Melvill is mentioned for the first time as are other references to the same species (or variety). Typical of the language employed is his comment upon Melvill's treatment: "Verily it seems that even the babes in 'Pinafore' could not have been more hopelessly mixed than were these poor little waifs." He then lays claim to "priority for both the name and description. This claim has especial reference to a criticism of the name applied to the shell in my former article." As Melvill's work was not mentioned in Ford's first article, and he now goes to lengths to discredit and/or disregard it, the last sentence quoted above seems to indicate that he had already received a communication from someone about Melvill's work.

Ford's second paper prompted a published reply from Smith (1893a) in which he comments that "Mr. Ford wrongly estimates the critical acumen of modern conchological students" and makes a derogatory comment about "the new French School of Conchologists," a French-English battle worth a study in itself. He then states that the main object of his complaint is that "when [Ford] published *Greegori* as a varietal name, it was already five years preceded by Mr. Melvill's varietal name *coloba*" and that "right and justice (and even courtesy) [emphasis as published] at once direct us in the present case."

This article was answered by Ford (1893c:79) more in generalities than in detail, but he mentioned that he had "examined hundreds of specimens, all showing the same distinctive specific characters." In his article published three months earlier (Ford 1893b:39) he had only examined "some fifty specimens."

A rejoinder came almost immediately from Smith (1894:102) which he starts off with "It is flattering to see that my remarks on Mr. Ford's so-called species of *Cypraea* have been deemed worthy of such lengthy consideration. It were easy to take Mr. Ford's remarks *seratim*, to make sharp replies and to confute them, but I value the pages of *The Nautilus* too highly to occupy them with matter of that description." After once again making his point that Melvill's name should have priority, he then castigates Ford for showing as quotations comments he did not make.

Ford then published (1894:130-131) what seems to have been the last exchange between the two on this subject. After referring to "the quoted phrases so



pathetically alluded to by the gentleman," he closes with ". . . as the justice of this claim has been heartily conceded by very many of our ablest conchologists, I do not propose inflicting the reader with any further remarks on this subject, now or hereafter."

The dispute rehearsed here is made notable only by the discovery of a pair of poems, believed to be previously unpublished. These two poems, written in beautiful script on note paper, were discovered in the archives of *The Nautilus*. These poems are obviously the product of R.E.C. Stearns, an interested bystander. Dr. R.E.C. Stearns (1827-1909) was an erudite gentleman with a varied background which included positions as paleontologist to the U.S. Geological Survey and assistant curator of mollusks at the U.S. National Museum. Stearns was a frequent contributor to *The Nautilus* and other scientific journals. He was certainly well known to the editor, Dr. H.A. Pilsbry, as Pilsbry named over a dozen species in his honor. Stearns had papers included in some of the issues of *The Nautilus* in which the Ford-Smith papers were published. We will never know if these poems were submitted for publication or solely for the amusement of the editor and others. The first poem, signed "R.E.C.S.," is dated "Mch. 10. 1894" just opposite the signature. The second poem, signed "John Bull," is dated "April 27. 1894" just opposite the signature. The significance of these dates, if any, is not known. The poems are here presented verbatim:

Ye Forde-Smythe Feude

A.D. 1894

It was a Cowrie Greegori,
That ledde toe much discourse –
Between ye Filadelphy Forde
and Smythe, on his high horse!

"What made ye Smythe go antick soe?"
Ye friends of Forde did saye –
Because his horse, a British beeste,
Was fain to run awaye,

And tramp ye Cowrie Greegori
Down in ye very dirt,
A thing that Forde could never stande,
A doing quite so perte.

Soe Forde he took ye hunke of words,
And threwe at Smythe, his jawe –
And Smythe hitte back withe other words,
Like scratching with ye clawe.

And Smythe and Forde, and Forde and Smythe
They wrestled in ye mudde –
Till all ye grounde, for myles arounde –
Was thick with hair and bloode.

The Forde got uppe and wiped hissselfe
As cleane as cleane may bee,
And waved ye Cowrie Greegori,
And shouted "Victoree" !



Nor stopped to wype his nose.

And after that, ye garbage man,
Ye garbage man so smarte,
Came rounde and picked ye pieces uppe,
Enuf to fill ye carte.

And gave ye same to Oistriches
A living at ye Zoo,
And every birde he ate a pecke
Of ye delicious stew;

Each at ye other cocked ye eye
And saide, "its much like oyster-pye"
And some birds said "it is a frye,
Made out of Cowrie Greegori."

Mch. 10.1894

R.E.C.S.

The Smythe-Forde Feude

A.D. 1894

He was a Quaker-city ladde
A bumptious ladde was hee
A bloodie challenge hee did sende
Toe Smythe across ye sea

What made ye Forde bee antick soe
And ride a horse soe high ?
Because ye Smythe did fullie scoffe
At Cowrie Greegori !

Now Smythe who was a gallant ladde
Sayde quicklie 'tis all right
Toe me belongs ye choice of armes

With konkshelles we will fighte

And Smythe ye British lyons tayle
Did twiste till hee did roare
Ye eagles tail Ford slylie pulled
Which made ye byrde toe clawe

Ye konkshelle bee a bloodie toole
Well armed with knobbie lumpes
With whiche toe deal ye enemie
Ye most owdacious thumpes.

Soon eache at eache did quicklie flie
Smythe pounded Forde fulle sore
While Forde gave Smythe ye awful digge
That made ye lyon roar.

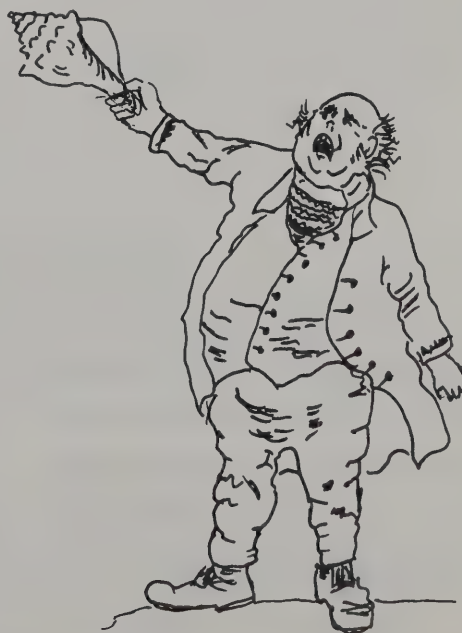
And on ye grounde they clinched and fout
Till they were blacke and blue
Odd zooks! it was a wicked fighte
A terrible shalloo.

Same Forde his nose was out of joynte
And Smythe his nose was lame
But stille they mauled and mauled away
For bothe ye chaps were game.

Five hundred konk-shelles busted were
All broke toe lyttle byttes
Soe savage were these cockie menne
Toe give each other fyttles

Ye grounde it was a woeful sighte
A gore of haire and blodde
And byttes of konk-shelles spread arounde
And trampled in ye mudde.

Soon both arose and scraped theirselves
Full manye a pecke of dyrtie -
Putte on new toggerie they did



Soon both arose and scraped theirselves
 Full manye a pecke of dyrte -
 Putte on new toggerie they did
 Down toe ye very shirte

An look each other in ye eye
 With manye a craftier wince
 Full quiche these same did shake ye Hades
 And took a friendlier drink

And then ye British Lyon roared
 Fulle soon his tayle did swage
 Ye Eagle byrde did spread his wings
 And fondle sailed awaye.

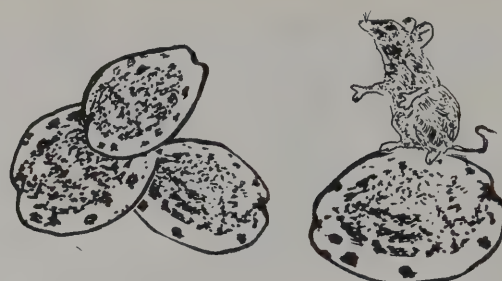
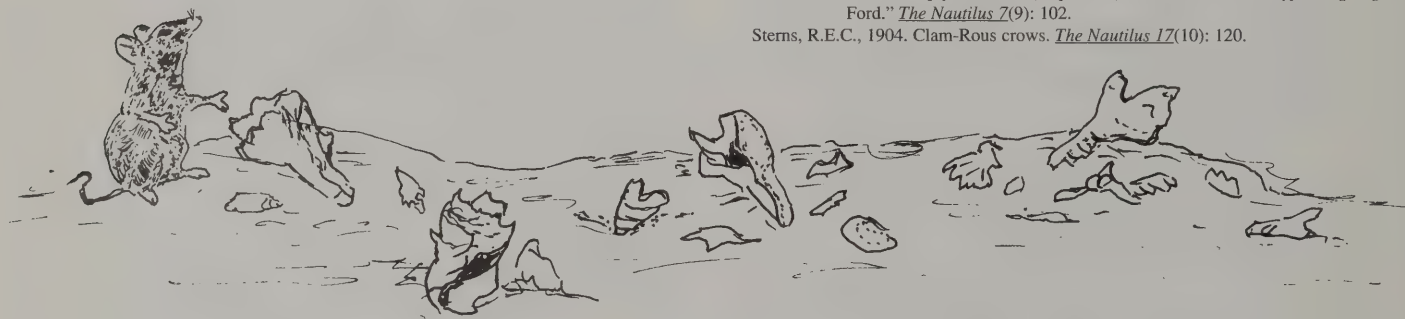
Then Smythe and Forde ye cowrie menne
 Odd Jokes, a noble two
 Long may they live toe tell ye tayle
 About ye grande shalloo.

April 27. 1894

John Bull

Not only was Sterns one of the outstanding scientists of his time, he obviously had a wonderful sense of humor and was an eminent word-smith. Who else would write an article about clams being dropped on slate roofs by crows under the title "Clam-Rous Crows"? As if the title were not pun enough, he then included this two-liner:

? "Ill fare the clams to hungry crows a prey,
 And brought to grief in such a crow-ill way."
 Rob. E.G. Sterns (1904: 120)



And who was the ultimate winner of the Ford versus Smith bout? Since it involves a cowry the jury is still out! Some authorities consider both *C. coloba* Melvill and *C. greegori* Ford to be synonyms of *C. chinensis* Gmelin. Burgess (1985: 118) lists *C. coloba* as a valid species with *C. greegori* in synonymy, but in the text he considers *C. greegori* to be a geographical variation of *C. coloba*, but then finishes by stating that he "will list *coloba* as a suspect valid species." As the expression from the old TV show went, "Thanks for clearing that up, chief."

You pick a name and I'll take the other and perhaps we can liven up the literature again.

Literature Cited:

- Burgess, C.M., 1985. *Cowries of the World*. CTP Book Printers, Cape, South Africa. Pp. xiv, 288.
 Ford, J., 1893a. Description of a new form of *Cypraea*. *The Nautilus* 6(10): 112-113.
 Ford, J., 1893b. Description of a new species of *Cypraea*. *The Nautilus* 7(4): 39-41.
 Ford, J. 1893c. Some (responsive) remarks relative to *Cypraea greegori* Ford. *The Nautilus* 7(7): 78-81.
 Ford, J., 1894. Some final remarks relative to *Cypraea greegori* Ford. *The Nautilus* 7(11): 130-131.
 Smith, E.A., 1893. Note on *Cypraea greegori* Ford. *The Nautilus* 7(6): 64-65.
 Smith, E.A., 1894. A reply to "Some (responsive) remarks relative to *Cypraea greegori* Ford." *The Nautilus* 7(9): 102.
 Sterns, R.E.C., 1904. Clam-Rous crows. *The Nautilus* 17(10): 120.

FOR SALE

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Ken Kautto
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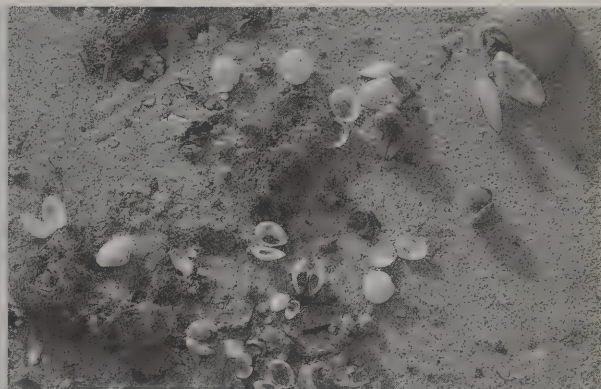
MERVEILLES DE LA MER

Lausanne - Switzerland

Perhaps some collectors still remember this name, meaning "Beauties from the Sea"? I was its happy owner until 1988. Now retired in Florida, I would like to sell a portion of my world-wide shell collection, consisting of the most representative specimens of the Philippines, Australia, Japan, the Caribbean and Central America.
 Ask for Price List: Maurizio Manciola,
 3810 Flagler Ave., Key West, FL 33040.
 Phone : (305)293-9804 - FAX (305)293-9674



São Sebastião Island — north view.



Shells after storm at Barreiro Beach, Ilhabela, São Sebastião Island

15 Years Collecting Around São Sebastião, São Paulo, Brazil

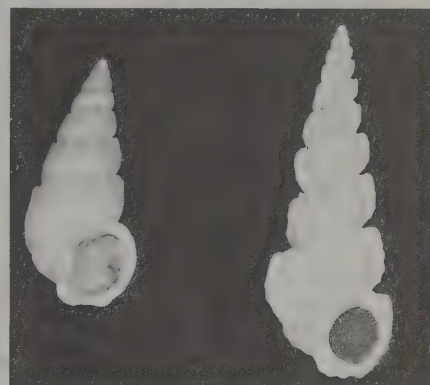
by José Coltro

Ilha de São Sebastião is the largest island on the Brazilian coast. It has a wonderful, well-preserved tropical rain forest, mountains over 2,000 meters high, hundreds of small, very clear rivers and fantastic waterfalls. The lee side of the island is occupied by the small city of Ilhabela. About 10,000 people live there, except in Brazil's summer, when 30,000 tourists invade the island. No bridge exists; there's only a ferryboat system to transport your car to the island. Few roads are in good condition, most of them dirt roads, including the one that crosses the island. Most people who live on Ilha de São Sebastião, including tourists who have beach houses there, don't want to change the quality of life on the island. It has good facilities — schools, hospital, supermarkets, shops, very good restaurants and more. But everything is limited to protect the natural environment. No large numbers of non-resident tourists are allowed to visit the island and you won't see huge tourist buses there. It is really a very nice place.

In 1982 Marcus and I made our first shelling trip to Ilha de São Sebastião, driving approximately 210 km from our home in São Paulo. At that time the north part of the São Paulo (State) coast was extremely wild and rather untraveled. On this first trip we found few shells, but on the next trip, the São Sebastião area became our best collecting source. This time we stayed several days on the island; we did our first snorkel on the lee or mainland side, near an islet called Ilha das Cabras. It was a wonderful surprise: under the first rock that we turned we found our first *Cypraea zebra* L., 1758. In the same day we saw over 75 specimens! It was like a dream come true.

From then on we visited São Sebastião every few weeks, always with our friend Luiz Francisco Viscardi, whose mother-in-law had a nice house on the island. At first we limited our expeditions to the lee side. Then we crossed the island on a very primitive 25-mile road to Castelhanos Bay. The trip was really fantastic — the kind you keep in a special place in your memories — through a gorgeous tropi-

Dredged at 40-45
meters, Buzios Island:
Left - *Opalia crenata*
(Linne, 1758), 24mm.
Right - *Cirsotrema dalli*
(Rehder, 1945), 25mm.



cal forest, full of birds, orchids, and wild animals, lovely small waterfalls and picturesque mountains. Finally we reached the other side of São Sebastião: A superb view! A very large beach edging a beautiful bay dotted with many small islands, and no people around. The only unpleasant aspect was a small bug, one we call "borrachudo," a larger cousin of Florida's most troublesome insect, the mosquito; but with a good repellent we were able to enjoy the place.

A few years later our base changed from Ilhabela to Luiz Francisco's new house in the city of São Sebastião, on the mainland across from the island. He bought a nice boat and we started to explore the rest of Ilha de São Sebastião. The north side has a few isolated beaches and excellent spots to dive, like the nearby islands of Buzios and Vitoria. Using the boat we began diving frequently and the shells started to appear. We found some really nice *Calliostoma depictum* Dall, 1927 and another *Calliostoma* species (cf. *C. bullisi* Clench and Turner, 1960). Species never found in southern Brasil were here: *Cypraea acicularis* Gmelin, 1791; *Conus regius* Gmelin, 1791 and *Bursa corrugata ponderosa* (Reeve, 1844). New species and sub-species were described from this area: *Oliva circinata totesi* Petuch, 1977 and *Calliostoma viscardi* Quinn, 1992.

In 1991 we started to dredge around the island, trying many places until we found the best spot, near Buzios Island — its name means, fittingly, "large snail." We dredged many species: the rare *Trophon pelseneeri* E.A. Smith, 1915 and *Typhis cleryi* (Petit, 1842) among them.

The island is still a wonderful place to look for shells and adventures, too. In spite of progress and the occupation of much of the mainland coast with houses and condominiums, the island has most of its coast unexplored — 90% of the island is a State Park, preserved just as it was 500 years ago! It is wonderful to have a paradise so close!

SHELLS FROM SÃO SEBASTIÃO, SÃO PAULO, BRAZIL

KEY:

SS - São Sebastião Island i - intertidal

Buz - Buzios Island d - dived

Vit - Vitoria Island dr - dredged

Ca - Castelhanos Bay

vc - very common

c - common

u - uncommon

r - rare

rr - very rare

d - dead collected

(*) - species described from this area

	SS	Buz	Vit	Ca
	d	d	d	d
POLYPLACOPHORA				
Ichnochitonidae				
<i>Calloplax janeirensis</i> (Gray, 1828)	u	u	c	c
<i>Chaetopleura angulata</i> (Spengler, 1787)			r	
<i>C. isabellei</i> (Orbigny, 1841)			r	
GASTROPODA				
Fissurellidae				
<i>Diodora cayenensis</i> (Lamarck, 1822)	r	u	u	u
<i>D. dysoni</i> (Reeve, 1850)		u	u	
<i>D. patagonica</i> (Orbigny, 1847)	u	u		d
<i>Emarginula tuberculosa</i> Libassi, 1859			rr	
<i>Hemitoma octoradiata</i> (Gmelin, 1791)		r	r	r
<i>Fissurella clenchi</i> Farfante, 1943	c			c
<i>F. rosea</i> (Gmelin, 1791)	c			c
<i>Hemitoma octoradiata</i> (Gmelin, 1791)		r	r	r
<i>Lucapina aegis</i> (Reeve, 1850)		u	u	u
<i>L. cf. sowerbii</i> (Sowerby, 1835)				r
<i>Lucapinella henseli</i> (von Martens, 1900)			rr	
<i>L. limatula</i> (Reeve, 1850)			r	
Acmaeidae				
<i>Collisella subrugosa</i> (Orbigny, 1846)	vc			vc
Trochidae				
<i>Calliostoma adpersum</i> (Philippi, 1851)	u			
<i>C. cf. bullisi</i> Clench & Turner, 1960		r	u	u
<i>C. depictum</i> Dall, 1927	u	c	u	u
<i>C. jucundum</i> (Gould, 1849)			rr	
<i>C. militaris</i> (von Ihering, 1907)		rr		
<i>C. rota</i> Quinn, 1992			r	
<i>C. viscardii</i> Quinn, 1922 (*)		rr	rr	
<i>Solariella carvalhoi</i> Lopes & Cardoso, 1958			u	
<i>Tegula hotesseri</i> (Orbigny, 1842)		r		
<i>T. viridula</i> (Gmelin, 1791)	c	vc	vc	vc
Turbinidae				
<i>Astraea latispina</i> (Philippi, 1844)	r	u	u	u
<i>A. tecta olfersii</i> (Philippi, 1846)	u	c	c	c
Phasianellidae				
<i>Tricolia affinis</i> (C.B. Adams, 1850)		r	r	
Neritidae				
<i>Neritina virginea</i> (L., 1758)	u			
Littorinidae				
<i>Littorina angulifera</i> (Lamarck, 1822)	c			c
<i>L. flava</i> King & Broderip, 1832	vc			vc
<i>L. lineolata</i> Orbigny, 1840	vc			vc
<i>L. ziczac</i> (Gmelin, 1791)	c			c
Rissoiidae				
<i>Rissoina princeps</i> (C.B. Adams, 1850)			rr	
Modulidae				
<i>Modulus modiolus</i> (L., 1758)	u	c	c	c
Cerithiidae				

<i>Alaba incerta</i> (Orbigny, 1842)	c				
<i>Bittium varium</i> (Pfeiffer, 1840)	c				
<i>Cerithium atratum</i> (Born, 1778)	vc	vc			
Turritellidae					
<i>Turritella hookeri</i> Reeve, 1849			r		
Vermetidae					
<i>Petalochonchus varians</i> (Orbigny, 1841)	d	rr			d
<i>Serpulorbis decussatus</i> (Gmelin, 1791)		rr	rr		
Strombidae					
<i>Strombus costatus</i> Gmelin, 1791		r			
<i>S. pugilis</i> L., 1758	u	c			
Hipponicidae					
<i>Cheila equestris</i> (L., 1758)			rr		
<i>Hipponix antiquatus</i> (L., 1767)	d	rr	rr		
Calyptraeidae					
<i>Calyptraea centralis</i> (Conrad, 1841)	d	u	u	u	d
<i>Crepidula aculeata</i> (Gmelin, 1791)	u	c	c	c	c
<i>C. plana</i> Say, 1822	d	u	u	u	d
<i>C. protea</i> Orbigny, 1835	d				d
Capulidae					
<i>Capulus incurvatus</i> (Gmelin, 1791)	u	u	u		
Cypraeidae					
<i>Cypraea acicularis</i> Gmelin, 1791			u	u	
<i>C. cinerea</i> Gmelin, 1791				rr	
<i>C. zebra</i> L., 1758	u	c	c	c	
Ovulidae					
<i>Cyphoma cf. mcgintyi</i> Pilsbry, 1939		r	r	r	
<i>Neosimnia spelta</i> (L., 1758)		u	u	u	
<i>Pseudocyphoma cf. intermedium</i> (Sowerby, 1825)		rr	rr	rr	
<i>Simnia acicularis</i> (Lamarck, 1810)		rr	rr	rr	
<i>S. uniplicata</i> (Sowerby, 1848)		rr	rr	rr	
Trividae					
<i>Erato maugeriae</i> (Gray, 1832)			r		
<i>Trivia candidula</i> (Gaskoin, 1836)			d		
<i>T. pediculus</i> (L., 1758)	d	r	r	r	
<i>T. suffusa</i> (Gray, 1832)			rr	rr	
Naticidae					
<i>Natica canrena</i> (L., 1758)	d	rr			
<i>N. cayennensis</i> Recluz, 1850			r		
<i>N. limbata</i> Orbigny, 1840	u			u	
<i>N. livida</i> Pfeiffer, 1840	rr				
<i>N. pusilla</i> Say, 1822	u		u		
<i>Polinices hepaticus</i> (Roding, 1798)	r			r	
<i>P. lacteus</i> (Guilding, 1834)	u	u	u		
<i>Sinum perspectivum</i> (Say, 1831)	r	r	r	r	r
Tonnidae					
<i>Tonna galea</i> (L., 1758)	r	r	r	u	u
Cassidae					
<i>Cypraeacassis testiculus</i> (L., 1758)			r	r	r
<i>Phalium granulatum</i> (Born, 1778)	u	u	u	c	c
<i>P. labiatum</i> Iheringi Carcelles, 1953	d				
Ranellidae					
<i>Cabestana felipponei</i> (Ihering, 1907)			rr		
<i>Cymatium cynocephalum</i> (Lamarck, 1816)		r	r		
<i>C. martinianum</i> (Orbigny, 1846)		rr			
<i>C. nicobaricum</i> (Roding, 1798)	rr	rr			
<i>C. parthenopeum</i> (von Salis, 1793)	u	c	c	c	c
Bursidae					
<i>Bursa corrugata ponderosa</i> (Reeve, 1844)		rr			

Cerithiopsidae

<i>Retilaskeya emersoni</i> (C.B. Adams, 1838)	r			u		
<i>Seila adamsi</i> (H. C. Lea, 1845)	u	c	c	c		

Triphoridae

<i>Triphora intermedia</i> (C.B. Adams, 1850)		u		u		
<i>T. cf. nigrocincta</i> (C.B. Adams, 1839)				r		

Epitonidae

<i>Epitonium albidum</i> (Orbigny, 1842)	u	u	u	u		
<i>E. angulatum</i> (Say, 1830)	u	u				
<i>E. candeanum</i> (Orbigny, 1842)	c					
<i>E. nautiae</i> (Morch, 1874)				u		
<i>E. novangliae</i> (Couthouy, 1838)				u		
<i>E. occidentale</i> (Nyst, 1871)	r	r	r	r	r	
<i>E. unifasciatum</i> (Sowerby, 1844)				r		
<i>Cirsotrema dalli</i> Rehder, 1945				r		
<i>Opalia crenata</i> (L., 1758)		rr	rr	rr		
<i>O. hotessieriana</i> (Orbigny, 1842)				rr		

Janthinidae

<i>Janthina janthina</i> (L., 1758)	d					
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Eulimidae

<i>Eulima mulata</i> Rios & Absalao, 1990		rr	rr	r		
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Muricidae

<i>Aspella</i> sp.				rr		
<i>Chicoreus senegalensis</i> (Gmelin, 1791)	u	c	c	c	c	r
<i>C. tenuivaricosus</i> (Dautzenberg, 1927)	d					r
<i>Favartia cellulosa</i> (Conrad, 1846)	r	r	r	u		
<i>Muricopsis marcusii</i> Vokes, 1994 (*)		r	r		r	
<i>M. necocheana</i> (Pilsbry, 1900)				r		
<i>Murexiella glypta</i> (M. Smith, 1938)				r		
<i>Phyllonotus oculatus</i> (Reeve, 1845)			r		u	
<i>Thais deltoidea</i> (Lamarck, 1822)	r					
<i>T. haemostoma floridana</i> (Conrad, 1837)	c	c	c		c	c
<i>T. rustica</i> (Lamarck, 1822)	rr					
<i>Trachypollia nodulosa</i> (C.B. Adams, 1845)	c	c	c	c		
<i>Trophon pelseneeri</i> E. A. Smith, 1915				r		
<i>Typhis cleryi</i> (Petit, 1840)				r		
<i>Urosalpinx haneti</i> (Petit, 1856)	d					r

Corallophiliidae

<i>Latiaxis cf. mansfieldi</i> (McGinty, 1940)		r	r			
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Buccinidae

<i>Pisania auritula</i> (Link, 1807)	c	c	c	c	c	u
<i>P. pusio</i> (L., 1758)	u	c	c	c	c	r
<i>Engina corinnae</i> Crovo, 1971				rr		
<i>E. turbinella</i> (Kiener, 1835)		u	u		u	

Columbellidae

<i>Aesopus obesus</i> (Hinds, 1844)				rr		
<i>A. stearnsi</i> (Tryon, 1883)				rr		
<i>Amphissa acuminata</i> (E. A. Smith, 1915)				r		
<i>A. cancellata</i> (Castellanos, 1982)				rr		
<i>Anachis isabellei</i> (Orbigny, 1841)	u	u	u	u	u	u
<i>A. lyrata</i> (Sowerby, 1832)	u	u	u	u	u	r
<i>A. melvillei</i> (Strebel, 1905)			r		r	
<i>A. scutulata</i> (Reeve, 1859)			r	r	r	
<i>A. sertulariarum</i> Orbigny, 1841	c	c	c		c	c
<i>A. sparsa</i> (Reeve, 1859)		u	u	u	u	
<i>Columbella mercatoria</i> (L., 1758)	r	r	u		u	
<i>Nassarina cf. metabrunnea</i> Dall & Simpson, 1901				rr		

Nassariidae

<i>Buccinanops gradatum</i> (Deshayes, 1844)	d					u
<i>Dorsanum moniliferum</i> (Valenciennes, 1834)	d					d
<i>Nassarius albus</i> (Say, 1826)		u	u	u	u	
<i>N. polygonatus</i> (Lamarck, 1822)	vc	vc				
<i>N. scissuratus</i> (Dall, 1889)				r		

Melongenidae

<i>Pugilina morio</i> (L., 1758)	rr					
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Fasciolaridae

<i>Fusinus marmoratus</i> (Philippi, 1846)	r	u	u	u	u	u
<i>Leucozonia nassa</i> (Gmelin, 1791)	r	u	u	u	c	r
<i>L. ocellata</i> (Gmelin, 1791)	rr					

Volutidae

<i>Odontocymbiola cleryana</i> (Petit, 1856)	d			r		d
<i>Zidona dufresnei</i> (Donovan, 1823)				u		

Harpidae

<i>Morum oniscus</i> (Linne, 1758)		rr	r		r	
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Olividae

<i>Agaronia travassosi</i> Morretes, 1938 (*)	rr					rr
<i>Eburna dimidiata</i> (Sowerby, 1850)				rr		
<i>Oliva circinata totesi</i> Petuch, 1987 (*)	r	u	u			
<i>Olivancillaria urceus</i> (Roding, 1798)						d
<i>O. vesica</i> (Gmelin, 1791)	r					u
<i>Olivella defiorei</i> Klappenbach, 1964	rr	r		r		
<i>O. verreauxii</i> (Duclos, 1857)	c					u

Marginellidae

<i>Prunum fulminatum</i> (Kiener, 1841)				rr		
<i>P. martini</i> (Petit, 1853)	d			r		d
<i>P. rubens</i> (Martens, 1881)				rr		
<i>Volvarina</i> sp.			rr	rr	rr	

Mitridae

<i>Mitra larranagai</i> (Carcelles, 1947)				rr		
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Cancellariidae

<i>Tritonoharpa leali</i> Hara., Petit & Verh, 1992				rr		
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Conidae

<i>Conus cleryi</i> Reeve, 1844	d			r		d
<i>C. pusillus</i> Lamarck, 1818				r	r	r
<i>C. regius</i> Gmelin, 1791					rr	
<i>C. totesi</i> Petuch, 1986				rr		

Turridae

<i>Brachytoma rioensis</i> (E.A. Smith, 1915)				r		
<i>Carinodrillia braziliensis</i> (E.A. Smith, 1915)				r		
<i>Cerodrillia thea</i> (Dall, 1883)				rr		
<i>Crassispira fuscescens</i> (Reeve, 1843)		r	u	u	u	
<i>Fusiturricula maesae</i> Rios, 1985				r		
<i>Ithyocythara hyperlepta</i> Haas, 1953				rr		
<i>Pilsbryspira albomaculata</i> (Orbigny, 1842)		r	r	r	r	
<i>P. leucocyma</i> (Dall, 1883)				r		
<i>Pleurotomella aguayoi</i> (Carcelles, 1953)				r		
<i>Polystira formosissima</i> (E.A. Smith, 1915)				rr		
<i>Pyrgocythara albovittata</i> (C.B. Adams, 1845)				r		
<i>Splendrillia espyra</i> (Woodring, 1928)				rr		

Terebridae

<i>Terebra doellojuradoi</i> Carcelles, 1953				rr		
<i>T. riosi</i> Bratcher & Cernohorsky, 1985				rr		
<i>T. taurina</i> (Lightfoot, 1786)		rr		rr		
<i>Hastula cinerea</i> (Born, 1778)	c					c
<i>H. hastata</i> (Gmelin, 1791)		u	u	u		

Architectonicidae

<i>Architectonica nobilis</i> Roding, 1798				rr		
<i>Heliculus bisulcatus</i> (Orbigny, 1842)				rr		
<i>H. cylindricus</i> (Gmelin, 1791)		rr	rr		rr	

Acteonidae

<i>Acteon pelecais</i> Marcus, 1981				rr		
<i>Mysouffa cumingii</i> (A. Adams, 1884)	d			rr		d

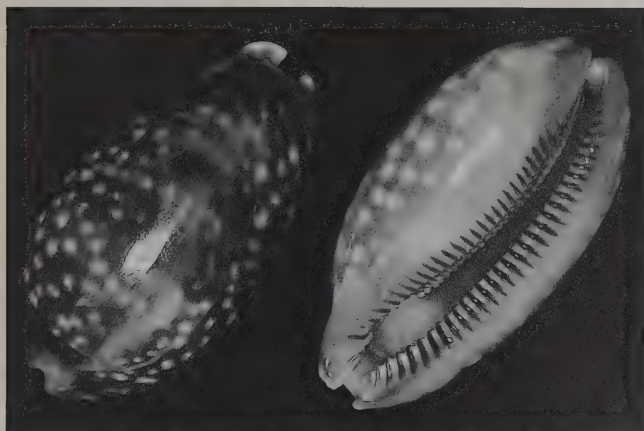
Ellobiidae

<i>Melampus coffeus</i> (L., 1758)	u					
<i>Pedipes mirabilis</i> (Muhlfeld, 1816)	r					

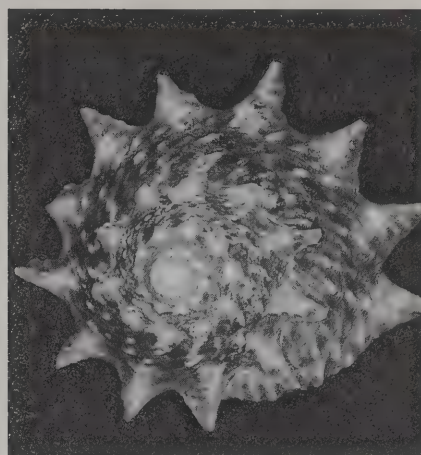
Siphonariidae

<i>Siphonaria hispida</i> E.A. Smith, 1890	c					
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BIVALVIA									
Nuculidae									
<i>Nucula puelcha</i> Orbigny, 1846				u					
<i>N. semiornata</i> Orbigny, 1842				u					
Nuculanidae									
<i>Adrana electa</i> (A. Adams, 1846)				rr					
<i>A. patagonica</i> (Orbigny, 1846)				rr					
<i>Nuculana acuta</i> (Conrad, 1831)				r					
<i>N. larranagai</i> Klapp. & Scarabino, 1968				rr					
Malletiidae									
<i>Malletia cumingii</i> (Hanley, 1860)				r					
Arcidae									
<i>Anadara brasiliensis</i> (Lamarck, 1819)	d							u	
<i>A. chemnitzii</i> (Philippi, 1851)	r								
<i>A. notabilis</i> (Roding, 1798)	r	u	u	c	u				
<i>A. ovalis</i> (Bruguiere, 1789)	u							u	
<i>Arca imbricata</i> Bruguiere, 1789	u	u	u	c					
<i>Arcopsis adamsi</i> (Dall, 1886)	c	vc	vc	vc					
<i>Barbatia candida</i> (Helbling, 1779)	c	vc	c	vc					
<i>Noetia bisulcata</i> (Lamarck, 1819)	u							u	
Limopsidae									
<i>Limopsis janeiroensis</i> E.A. Smith, 1915				r					
Glycymeridae									
<i>Glycymeris longior</i> (Sowerby, 1833)	d							r	
<i>G. undata</i> (L., 1758)								r	
Mytilidae									
<i>Brachidontes exustus</i> (L., 1758)	c							vc	
<i>Lioberus castanea</i> (Say, 1822)		rr	rr	r	rr				
<i>Lithophaga bisulcata</i> (Orbigny, 1842)	u								
<i>Modiolus carvalhoi</i> Klappenbach, 1966	rr	r	r	r					
<i>Mytella charruana</i> (Orbigny, 1842)	c								
<i>Mytilus edulis platensis</i> Orbigny, 1846	c							vc	
<i>Perna perna</i> (L., 1758)	V		vc	vc	vc				
Pteriidae									
<i>Pinctada imbricata</i> Roding, 1798		u	u	u					
<i>Pteria colymbus</i> (Roding, 1798)		u	u	u					
Pinnidae									
<i>Atrina seminuda</i> (Lamarck, 1819)	d	u	u	u	u	d			
Limidae									
<i>Limaria inflata</i> (Lamarck, 1819)		rr	rr		rr				
<i>L. pellucida</i> (C.B. Adams, 1846)		rr	rr		rr				
<i>L. thryptica</i> (Penna, 1971)		rr							
Ostreidae									
<i>Ostrea cristata</i> Born, 1778						rr			
<i>O. equestris</i> Say, 1834	vc					vc			
<i>O. puelchana</i> Orbigny, 1841	c					c			
Plicatulidae									
<i>Plicatula gibbosa</i> Lamarck, 1801	rr			rr					
Pectinidae									
<i>Chlamys benedicti</i> (Verrill & Bush, 1897)			rr	rr	rr				
<i>Leptopecten bavayi</i> (Dautzenberg, 1900)	r	r	r	r	r	rr			
<i>Lindapecten tehuelchus spinosula</i> (Bavay)				r					
<i>L. tehuelchus</i> (Orbigny, 1846)	d					d			
<i>Nodipecten nodosus</i> (L., 1758)	r	u	u	u	u	u			
<i>Pecten ziczac</i> (L., 1758)	u	u	u	c					
Spondyliidae									
<i>Spondylus ictericus</i> Reeve, 1856		r	u		u	r			
Anomidae									
<i>Anomia ephippium</i> (L., 1758)	d					d			
Lucinidae									
<i>Codakia costata</i> (Orbigny, 1842)		r	r	u					
<i>C. orbicularis</i> (L., 1758)				u					
<i>C. orbiculata</i> (Montagu, 1808)		rr	r		r				
<i>Divaricella quadrisulcata</i> (Orbigny, 1842)	u								
<i>Lucina pectinata</i> (Gmelin, 1791)	u								
Ungulinidae									
<i>Diplodonta patagonica</i> (Orbigny, 1842)	r								
<i>D. punctata</i> (Say, 1822)	u								
Leptonidae									
<i>Lepton cema</i> (Narchi, 1966)	rr								
Carditidae									
<i>Carditamera micella</i> Penna, 1971				u					
Chamidae									
<i>Arcinella brasiliensis</i> (Nicol, 1953)	r			r					
<i>Chama congregata</i> Conrad, 1833	r	u	u	u	u				
<i>C. macerophylla</i> (Gmelin, 1791)		r	r		r				
Cardiidae									
<i>Laevicardium brasiliensis</i> (Lamarck, 1819)	c	c	u	u	u		u		
<i>Papyridea semisulcata</i> (Gray, 1825)					r				
<i>P. soleniformis</i> (Bruguiere, 1789)	u	u	u	u	u	rr	u		
<i>Trachycardium muricatum</i> (L., 1758)	c	c	c	c	c	r	c		
Mactridae									
<i>Anatina anatina</i> (Spengler, 1802)		rr							
<i>Mactra fragilis</i> Gmelin, 1791	u	u		u					
<i>M. iheringi</i> Dall, 1897	r								
<i>M. isabelleana</i> Orbigny, 1846	r					r			
<i>M. janeiroensis</i> E. A. Smith, 1915	r					r			
<i>M. petiti</i> Orbigny, 1848	r	r		r					
<i>Mactrellona alata</i> (Spengler, 1802)	r					rr			
<i>Mulinia cleryana</i> (Orbigny, 1846)	r			r					
<i>Raeta plicatella</i> (Lamarck, 1818)	d		rr		d				
Mesodesmatidae									
<i>Mesodesma mactroides</i> Deshayes, 1854	u								
Solenidae									
<i>Solen obliquus</i> Spengler, 1794		u	u		u				
<i>S. tehuelchus</i> Orbigny, 1843	u	u				u			
Tellinidae									
<i>Macoma cleryana</i> (Orbigny, 1846)	u	u							
<i>Strigilla carnaria</i> (L. 1758)	c				c				
<i>S. pisiformis</i> (L. 1758)	u				u				
<i>Tellina alternata</i> Say, 1822	r	r	r		r				
<i>T. lineata</i> Turton, 1819	c	c	c	c	c				
<i>T. listeri</i> Roding, 1798	rr	r	r	r					
<i>T. petiti</i> Orbigny, 1846	rr								
<i>T. punicea</i> Born, 1778	u				u				
<i>T. sandix</i> Boss, 1968	u				u				
<i>T. trinitatis</i> (Tomlin, 1929)				r					
<i>Temnoconcha brasiliensis</i> Dall, 1921	r								
Semellidae									
<i>Semele proficua</i> (Pulteney, 1799)	c	vc	c	c	u	r	u		
<i>S. purpurascens</i> (Gmelin, 1791)	u	c	c	c	c	r			
Psammobiidae									
<i>Heterodonax bimaculata</i> (L., 1758)	r			r					
<i>Sanguinolaria cruenta</i> (Lightfoot, 1786)	r				u				
<i>S. sanguinolenta</i> (Gmelin, 1791)	r	r			r				
<i>Solecurtus cumingianus</i> (Dunker, 1861)	u	u							
<i>S. sanctaemarthae</i> Orbigny, 1842		rr	rr	rr					
<i>Tagelus divisus</i> (Spengler, 1794)	r	r							
<i>T. plebeius</i> (Lightfoot, 1786)	c	c			c				
Donacidae									
<i>Donax gemmula</i> Morrison, 1971	u								
<i>D. hanleyana</i> Philippi, 1842	u				c				
<i>Iphigenia brasiliensis</i> (Lamarck, 1818)	c	c			c	c			
Veneridae									
<i>Amiantis purpuratus</i> (Lamarck, 1818)	r				c				
<i>Anomalocardia brasiliensis</i> (Gmelin, 1791)	vc	c		c					
<i>Chione cancellata</i> (L., 1767)	c	c	c	c	c				
<i>C. intapurpurea</i> (Conrad, 1849)	r								



Cypraea zebra taken under rocks at 1-2 meters. 100-102mm.



Astraea latispina
(Philippi, 1844)
taken on rocks
at 10-15 meters.
45mm.

<i>C. paphia</i> (L., 1767)	u	u	u	c	u	r	u
<i>C. pubera</i> (Bory de St. Vincent., 1827)	r						
<i>C. subrostrata</i> (Lamarck, 1818)	c	c	c	c	c	u	c
<i>Cyclinella tenuis</i> (Recluz, 1852)	r	r	r	r	r		
<i>Dosinia concentrica</i> (Born, 1778)	r	u	u	u			
<i>Gouldia cerina</i> (C.B.Adams, 1845)				u			
<i>Macrocallista maculata</i> (L., 1758)	u	u	u	u	u		
<i>Pitar circinatus</i> (Born, 1778)	rr						
<i>P. fulminatus</i> (Menke, 1828)	c	c	c	c	c	u	c
<i>P. palmeri</i> Fischer-Piette & Testud, 1967	r	r	r	r			
<i>P. rostratus</i> (Koch, 1844)	rr						
<i>Protothaca pectorina</i> (Lamarck, 1818)	r	u					
<i>Tivela fulminata</i> (Valenciennes, 1827)				rr			
<i>T. mactroides</i> (Born, 1778)	u	u				c	
<i>T. ventricosa</i> (Gray, 1838)	r					u	
<i>Transenella cubaniana</i> (Orbigny, 1842)		r	r	u	r		
<i>T. stimpsoni</i> Dall, 1902				u			
<i>Transenpitar americanus</i> (Doello-Jurado,					r		
<i>Ventricularia rigida</i> (Dillwyn, 1817)	r	u	u	u	u		
Cooperellidae							
<i>Cooperella atlantica</i> Rehder, 1943	rr						
Corbulidae							
<i>Corbula caribaea</i> Orbigny, 1842				u			
<i>C. cymella</i> Dall, 1881				u			
<i>C. lyoni</i> Pilsbry, 1897				r			

<i>C. operculata</i> Philippi, 1849				u			
<i>C. patagonica</i> Orbigny, 1846				c			
Hiattellidae							
<i>Hiattella arctica</i> (L., 1767)		r			r		
Pholadidae							
<i>Cyrtopleura costata</i> (L., 1758)		rr					
Thraciidae							
<i>Thracia similis</i> Couthouy, 1839		rr					
Periplomatidae							
<i>Periploma margaritaceum</i> (Lamarck, 1801)		r					
Cuspidariidae							
<i>Cardiomya cleryana</i> (Orbigny, 1846)					r		
<i>Cuspidaria platensis</i> E.A. Smith, 1915					rr		
SCAPHOPODA							
Dentaliidae							
<i>Antalis antillarum</i> (Orbigny, 1842)					u		
<i>Dentalium americanum</i> Chenu, 1843		u			u		
CEPHALOPODA							
Spirulidae							
<i>Spirula spirula</i> Lamarck, 1801		r					
Argonautidae							
<i>Argonauta nodosa</i> Lightfoot, 1786		d	r				

First R. Tucker Abbott Award Given at Jacksonville

Dr. Alfredo E. Romeu, M.D. was the winner of the first annual R. Tucker Abbott Award at the Jacksonville Shell Show held in St. Augustine, Florida, August 15-17, 1997. The Tucker Abbott Award was created by the Jacksonville Shell Club in memory of Dr. Abbott, to be given to the exhibit which best exemplifies worldwide and educational interest in shells. Dr. Romeu says, "due to my personal friendship with Dr. Abbott, from whom I learned so much, this award has a special meaning for me." His 85-foot-long display of 30 cases featured over 3,000 tree and land shells from all over the world. Judges were Dr. Emilio Garcia, pictured above right with Dr. Romeu, and Dr. Jose Leal.



Leonard C. Hill, III 1950-1997

On November 6, 1997, the international shell world lost one of its most outstanding members. Leonard C. Hill, III, age 47, passed away in Hastings, Nebraska where he was visiting his father. Len grew up there and developed a passion and intense curiosity for many aspects of natural history; after graduating from Hastings College, he joined the Navy where he became an Ocean Systems Technician.

In 1979, Len moved to Miami where he worked as a marine biologist for the National Oceanic and Atmospheric Administration. The focus of his research concerned the environmental impact of humans on the marine ecosystem. He became an authority on the taxonomy of planktonic marine invertebrates, with recent work concentrating on the fauna of Florida Bay and the Florida Keys. At the same time, Len became an internationally recognized expert on molluscan taxonomy and identified many new species; he was honored by more than thirty species named in his honor.

Len developed a shell business as an outgrowth of his hobby, and with a worldwide clientele, he developed a reputation for honesty, for impeccable ethics and for supplying outstanding specimens. In his business dealings, many of his customers became good friends, and he visited many of them around the world. He enjoyed judging shell shows and meeting his customers and friends at these events. Recently, he authored two books on shells; "The World's Most Beautiful Shells" and "Shells, Treasures of the Sea."

Len was known for his warm, good humor and his most loyal, loving and enthusiastic friendships. He enjoyed a multitude of interests and was a well informed and passionate collector of many things besides shells. He leaves his father, Leonard Hill, Jr., 1230 North California Avenue, Hastings, Nebraska 68901-3221 USA and his partner of many years, Edward Paul, 10501 S.W. 102 Avenue, Miami, Florida 33176 USA.

Those of us attending the Philadelphia Shell Show November 1-2 feel very fortunate to have shared a wonderful, memorable weekend with our dear friend Len, where he was one of the judges and shell dealers. Many people all over the world will have recollections of his interesting, well traveled life.

—Sue Hobbs

Len Hill was kind, warm, loyal, generous, and helpful, and one of the most ethical dealers in the profession. When looking at his list or his specimens one never had to consider quality.

—Linda Brunner, Panama City, Florida

As Len left a considerable body of work in your field, you will often cross the tracks he has left. You will always have the memory of his beautiful friendship and you will always have the work he has left behind. It is so painful when that which enriches us is withdrawn, but we have at least experienced it and are so much the better for it.

—Scott Kenan, Stone Mountain, Georgia

Oh dear, I am shocked to hear that. Len was certainly one of my favorite shell dealers.

—Simon Aiken, Greenville, Delaware

Len Hill was a long-time member of the Hawaiian Malacological Society and a frequent contributor to the Hawaiian Shell News. All our members will miss him.

—Wesley Thorsson, Honolulu, Hawaii

Thanks for letting us know about Len. The shell world has suffered another great loss. He and I shared a love of Olives.

—Lucy Clampitt, Houston, Texas

Len's interest in land shells equalled his passion for studying and collecting marine species. This is evident in the number of beautiful land shell photos Len included in his two books. Both books will be lasting tributes to his love for conchology.

—Rich Goldberg, Ellicott City, Maryland

He was our first friend in US and one of the best ones... a very nice person... and we'll miss him very much... someone ... reached my brother in the Philippines and he called my mother crying in the phone... I was with him last week and... I can't imagine that I had my last moments at his side....

—Marcus Coltro, São Paulo, Brazil

I am reminded of the following definition of life given by an Sioux Indian on his deathbed in 1870: "What is life? It is the flash of a firefly on a warm summer evening, the breath of deer in the winter, the little shadow which runs across the prairie losing itself in the sunset."

—Charles Krueger, Hockessin, Delaware

Who among us would not be pleased to be remembered as a person of warmth, good humor, and impeccable ethics, and as a loyal friend?

—Jean Roe

Leonard was a dear kind gentle individual who was always honest in any molluscan dealings...I guess that Leonard had a special place in my heart because he was also very interested in the Olividae, and even put up with my passion for the Olivellas! Leonard will be sadly missed, his passion for life and mollusca.

—Paul Drez, Albuquerque, New Mexico

English is not my language, and I find particularly difficult to express personal feelings, but I can simply say we will miss him a lot; we will miss the friend, the biologist, and the gentleman. He was unique.

—Maria Angioy, Rome, Italy

In the brief while that I have known Len, I came to appreciate him as a person. He was always sincere and friendly – a very likeable person. He enjoyed his shells very much and conducted his business as a true gentleman. His passing is a great loss to everyone in the shell community.

—Brian Hayes, Port Elizabeth, South Africa

I have thought of him every day, and it seems like a bad dream. I expect to wake up to a different reality

—Travis Payne, Decatur, Alabama

I know it is certainly better that anyone that dies without pain and suffering, and if possible, doing something they enjoy. We can all feel peace in knowing Len did not suffer, he was not alone, and he was doing something he enjoyed ... I don't think any of us will really realize this loss until the shell shows, when we automatically expect people to be where they have been for years... This year will not be the same.

—Linda Sunderland, Sunrise, Florida

I will miss his beautiful view of the shell world and his compassion for all shellers. I will miss his knowledge and willingness to always help and share. I will miss him!!!!

—Marilyn Lucarelli, Ballston, New York

I think Chaucer knew the ilk of Len Hill. This from the Canterbury Tales: "There was a knight and that a worthy, who, from the time he first rode abroad, loved...faithfulness and honor, liberality and courtesy....In all his life he never spoke discourtesy to any living creature, but was truly a perfect gentle knight...and went to do his pilgrimage."

—Harry Lee, Jacksonville, Florida

Digital Photography Of Shells

by Ross Gundersen



Figure 1: Digital photograph of *Latirus infundibulum* Gmelin, 1791 showing effects of contrast on image quality. Above: low contrast Center: normal contrast Below: high

Remember those hours we spent in the darkroom, feeling like a mushroom, honing our skill in developing film, dodging and burning to produce the best print from a negative. All of this can now be handled by a computer without a negative, print, or slide even being involved. It is no big surprise that photography has also gone digital. After all, NASA has been doing it for years and technological advances do trickle down from NASA. Well, let's take look at what digital photography is all about.

Simply put, digital photography involves taking a picture with a camera that has a lens which projects a light image onto a CCD (charge coupled diode) device. The CCD converts the light information into an electrical signal. The next step involves a computer chip or board which converts the electrical signal into a digital signal (bits and bytes). This chip or board is technically called a video digitizer: it converts the analog electrical signal into the digital signal. The picture ends up as a mathematical array of data in terms of position, intensity and color. Those of us who are familiar with computers have heard of 640X480 or 800X600 computer displays. These figures actually refer to a television picture made up from an array of information composed of 640X480 or 307,200 pixels. A pixel roughly corresponds to one piece of digital data containing position, intensity and color information.

Just think about the possibilities! A computer can manipulate the

digital data which forms a picture. One pixel can be made darker or lighter, or its color can be modified. The computer can find all pixels in a picture which have the same intensity or color, or both. What does this really mean? At a touch of a finger you can change contrast, gamma, hue, and saturation. You can globally, and with precision, modify any aspect of a digital picture, or only a specific small area of a picture. The strength of digital photography lies in image manipulation, not in simply being able to take a picture. Or to quote myself, "Analog photographers, eat your hearts out!" The end result can be just as good as analog photography and easier to achieve.

Equipment:

1. computer with a minimum 640X480 24-bit color display
2. digital or a video camera with a video digitizer board
3. computer software for image processing, e.g. Adobe Photoshop, Aldus Photostyler, PhotoShop Pro
4. auxiliary lenses for close up photography such as a set of +1, +2, and +3 close-up lenses, a macro lens adapter
5. lighting equipment for producing an even, color-balanced illumination
6. tripod or copy stand to reduce vibration

Digital Camera: Digital cameras have been around for a number of years, but affordable models have only recently began to appear on the market. Casio, Hitachi, Kodak, and Sony are a few of the available brands. The prices on these cameras range from approximately \$400 to \$10,000. The expected brand names — for example Nikon — are usually at the upper end of the price range. The main differences between the two ends of the price range are resolution, interchangeable lenses and finders, and memory for image storage.

Resolution: The more affordable models usually have two resolutions: 320 X 240 and 640 X 480 pixels. These correspond to low and high resolution pictures. When the camera uses a greater number of pixels to take a picture, the resolution, or the ability to see smaller details, increases. More pixels means more resolution. This does not mean that we can enlarge a 320 X 240 picture to 640 X 480 and increase resolution. The upper end cameras have a resolution of 1100 X 1400 pixels, approximately equivalent to an 11"X14" picture.

Lenses/Finders: The low end cameras have a small LCD (small television display) in lieu of a typical view finder and a permanently mounted lens which may or may not have a zoom capability. Close-up and macro lens sets are now becoming available for these cameras. The LCD is used both to compose our pictures and to immediately view a picture once taken. The upper end models are essentially Single Lens Reflex (SLR) with which we compose and take a picture using the same lens. These cameras accept a full range of interchangeable lenses and finders. We operate these cameras just like a normal SLR, with complete control of focus, shutter speed and f-stop. However, unlike a normal SLR, we have to plug the camera into a computer to view our pictures.

Video Digitizing Boards: A video digitizing board is required if we are using a normal video camera. The board converts the analog signal from the video camera into a digital signal. Video digitizing boards range from about \$200 to \$2,000. The higher cost ones take higher resolution pictures and have more capabilities for color and contrast control. The Minolta Snappy is an excellent choice because of its low cost and its high resolution (up to 1500 X 1100). However, be aware of the fact that the Snappy is a memory hog. To achieve maximum resolution, we must set the horizontal capture size to the horizontal resolution of our video camera. Setting the horizontal capture size to greater than that of our camera will not increase resolution.

Computer Software: The above-listed image processing software all do the same general tasks, but differ from one another in terms of fancier bells, whistles and pricing. All of them perform equally well at the basic image processing tasks of contrast, gamma, sharpness, satu-

ration, hue, multiple image loads, image outlining, etc.

Let's Take a Picture: Taking pictures of shells is macrophotography or close-up photography. We put our videocamera, or digital camera, on a tripod and attach the correct close up lens or macro lens. Then we place our shell on a black background and hold it in place with clay for larger shells or two sided tape for micromollusks. We compose our shot in such a way that the image of the shell fills the field, giving us maximum resolution. Next we focus our camera and observe contrast, focus and color.

Contrast: Looking through our view finder or at our LCD display we may notice inappropriate contrast. This necessitates adjusting the lighting of the shell until the image of the shell appears crisp. The driver programs for most video digitizer boards also allow for some control of contrast. However, it is better to adjust contrast at the level of the camera. A low contrast as well as a high contrast image lacks detail (Figure 1), and the camera or image processing can't put detail back into the picture.

Focus: Now we run into the bane of all close up and macro photography: Depth of Field. Not all of our shell may be in focus: the depth of field does not include the whole shell. Our first inclination may be to stop down the lens by switching to a higher f-stop. This will indeed increase our depth of field, but the less expensive consumer video and digital cameras usually do not allow us control of f-stops or shutter speeds! What do we do now? Simply take a series of pictures, making sure that each part of the shell is in focus in at least one of the pictures. This may not be possible unless we can switch our camera to manual focus. A very important aspect of this technique is to move only the shell to achieve focus; do not refocus the camera.

Color: Our control of color is limited to lighting. If we are using natural light the color balance will be correct. When using artificial lights, our light source should be capable of producing white light, not the reddish light produced by regular light bulbs or the bluish light of cool white florescent bulbs. Give the camera a shell illuminated with reddish light and it will appear reddish. It is always better to address problems with illumination and color before the picture is taken rather than

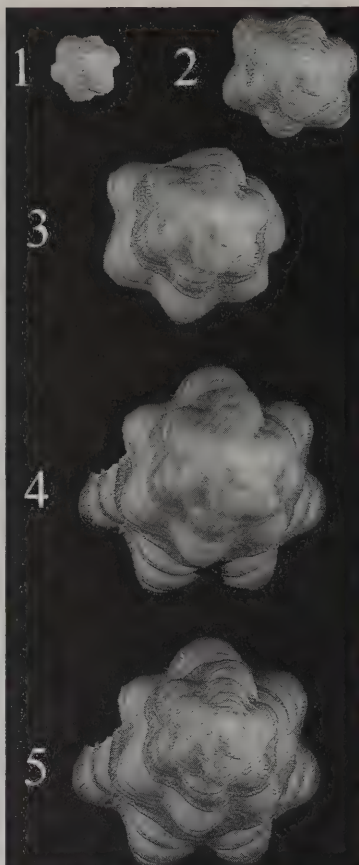


Figure 2: A series of photographs demonstrating how to achieve an extreme depth of field. Images 1-4 were taken with an f-stop of 16 and then assembled to produce the final image 5. Image 1 was added to image 2, image 1/2 was then added to image 3, image 1/2/3 was added to image 4 to achieve the final image 5. The depth of field achieved is 25 mm (1 inch)

afterwards. I use a variable halogen fiber optic illuminator. Not only does it put out the correct light spectrum, but also the goose neck fiber optic cables allow precise and easy-to-position lighting control.

Image Processing: Now comes the true forte of digital photographic techniques: image assembly, color adjustment, image sharpening, and final contrast adjustments.

Image Assembly: Image processors allow us to outline an area of one image and drag it into another image and control its final placement. Guess what? This means that depth of field is no longer a problem! We simply assemble the in-focus parts of the serial pictures into one picture. Figure 2 shows a single final image and the original four images from which it was assembled.

Color Adjustment: The image processor can control chroma, hue, intensity — in short, the appearance of any specific color in the image. In addition, since we can outline any part of the image, we can do very local color adjustments. Now is the time we can look at the shell and match its colors. We have found that the major adjustment will usually be saturation, because the illumination used to take our picture had a stronger-than-normal red component. An additional adjustment can insure that the background color is completely black. The image processor can outline the background areas which are then painted absolutely black. We can magnify the image and manually paint in the remaining non-black areas of the background while avoiding the shell.

Focus Adjustments: Sometimes our focus on an image may be slightly off. We can change this by doing "detail" or "sharpness" adjustments. These do not increase the resolution of our picture, but only visually sharpen the image.

Contrast: Our last adjustment will be to the final contrast of the image. Either a contrast increase or decrease may be necessary. Remember that both low and high contrast images lack detail.

Remember, the sky is the limit: And the final beauty of digital photography: What if we are taking a picture of our only specimen of a very rare shell, one with a hole in it. Heck!!! Well, let's don't just stand here. We can FIX IT! We simply clone a small area and fill the hole with it.

Trivia

Who is the author of the Phylum Mollusca?

Answer: Baron Georges Cuvier in 1795.

What's SCUM?

Answer: Southern California Unified Malacologists, an informal group of malacologists who meet to exchange information...no dues, no officers, no publications.. For further information contact Terry Arnold at tamold@cts.com.

Presto Change-o

Once there was a wee, temperate-water bivalve named *Abra cadabra* Eames and Wilkins, 1957, but along came the taxonomists and, presto changeo! it is no more. The tiny semelid clam is now known as *Theora cadabra*, the specific name looking rather meaningless in the context of its new present generic assignment. It doesn't pay to be too clever when naming a new species.

Natal Museum Campaign Makes A Difference

The Natal Museum Crisis has lessened as a result of the massive outpouring of support for the museum [*AmConch* 25(3):p.8] from concerned institutions, scientists and hobbyists around the world. It seems that technology got into the act as well, and did its own bit for the museum's future: the initial deluge of faxes (which reportedly caused the fax machine of the main department concerned to burn out) and letters certainly took the authorities by surprise, causing them to reconsider their plans for the future of the Natal Museum, and to invite the museum staff to make a submission on their own "vision" for the future of this malacologically important institution. Although as yet no final decisions have been taken, it is likely that without the intervention of the global scientific community the fate of this South African national treasure would have been sealed months ago.

On *Neritodryas cornea* (L., 1758), In A Roundabout Way.

by Emilio F. Garcia



In the New Georgia habitat of *Neritodryas cornea*, our guide shows us the way.

Photo: Emilio Garcia

Neritodryas subsulcata (Sow., 1836) crawling on dead leaves on the forest floor. Both species of *Neritodryas* are very light weight compared to their marine relatives of the same size (about 25mm). Two probable reasons for this are that calcium carbonate is not as available as in a marine habitat, and that a lighter shell obliges the *Neritodryas* to carry around less weight in a terrestrial and arboreal habitat, a definite plus for maneuverability.

When I got back from my trip I wrote about this matter to the well known Belgian malacologist and president of the Belgian Society of Conchologists, Mr. Andre Delsaerdt. I knew that he was very interested in the molluscan fauna of the Solomons and that he was working on the Neritoidea of those islands. He replied that he had also collected *N. cornea* on trees!

So, here we have them, the nerites: marine, fresh water, terrestrial and arboreal. Next time: aerial? Maybe we will find them parasitic on those flying pigs we read so much about on the CONCH-L listserver.

115 Oak Crest Dr., Lafayette, LA 70503, USA. Email: efg2112@usl.edu

CONGRATULATIONS!

Just at press time, 12:52 on November 15, Baby Goldberg, an 8 lb. 9 oz. girl, made her debut! Mother Meg and Baby Alexa Jewel doing fine, Father Rich and Sister Hallie ecstatic!

American Conchologist staff member "Supersheller" Gene Everson has had another shell named for him, this one a large and lovely trophon from the Kerguelan Islands. Roland Houart described the 75mm *Trophon eversoni* in Volume 56, No. 1 (1997) of *Venus*, Japanese Journal of Malacology.

Congratulations to the Austin (Texas) Shell Club on their new newsletter, *The Auger*, edited by Rosalie Taylor. We just received Volume 1, number 2.

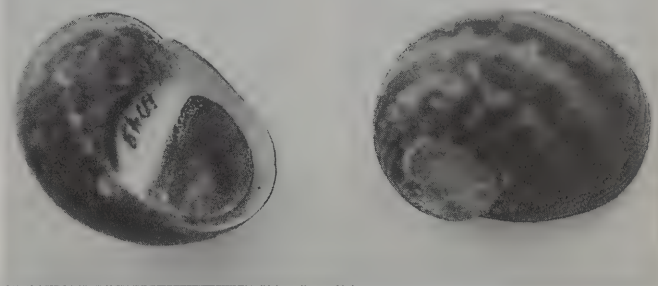
Last summer, I spent three weeks in the Solomon Islands collecting marine snails. However, while in Munda, a small village in the large, forested island of New Georgia, I would get up very early, before our group of collectors began their daily routine of boat trips to different offshore islands, and I would walk to the edge of town and start looking for landsnails. I did this thanks to the advice of Homer Rhodes, an ardent Florida collector who had been there before. It was very rewarding, thus I always thought my day was complete even before it began for the rest of the group.

One of the hotel's tourist trips in Munda is a visit to a cascade about 10 kilometers from town; we elected to go there our last day on the island. The truck we were going to use was not large enough for all, so those interested in collecting land snails and the most adventurous decided to go first, be dropped a couple of kilometers before the cascade, and walk and collect while the truck went back for the second group.

One of the many dreams I had harbored for years was to collect *Papuina* in the Solomons. I was not left unrewarded. Some fifteen minutes after we were dropped off along the forested road, early in the morning, with no other sound but nature's, I saw my first live *Papuina* specimen ever, crawling up a tree trunk, waiting to be photographed in all her splendor. I let out what must have been an unintelligible sound and ran toward it with my camera. I wanted to take its picture before it vanished, because vanish it must — it couldn't be real. How much is a feeling like that worth? Everything. It is what a happy life is made of. Later on we found others, and other species. But that first one . . .

When the second bunch arrived, we left the main road for a narrow, thickly forested path to the cascades (see picture), and we kept looking for tree snails. It was rather dark because of the thick vegetation, so when I saw a dark spot some 8' to 10' from the ground, on the leaf of a *Heliconia* plant, I thought it was a tree snail. It was not. It was a *Neritodryas cornea* (L., 1758)!! At first, I thought it was an aberration, since there was no body of water in the vicinity. However, I, and other members of the group, later found many more specimens in the same habitat; at times there were three or four specimens on one leaf.

On the way back to Munda we followed the same pattern in reverse. The last group went first and the indefatigable first group went last. And, once again, perseverance won. Not only did we find more species, but Kathy Krattli, a superb shell collector from O'Fallon, Missouri, found two specimens of



Arboreal *Neritodryas cornea*. Photo: Dr. Cecil Bankston

PEANUT ISLAND CHECKLIST

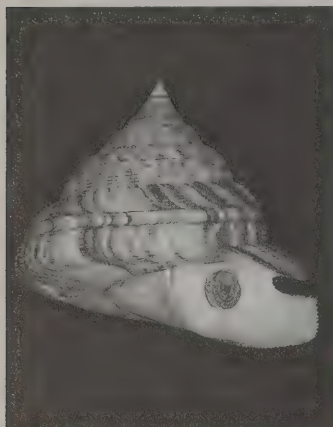
The Jacksonville Shell Club has published a checklist of mollusks for the well-known and very productive Florida collecting spot, Peanut Island near Lake Worth in Palm Beach County. Harry G. Lee compiled this checklist of some 321 species, based on the work of at least 17 professional and amateur collectors, over a 34-year period. The list appeared in the November issue of the Jacksonville Shell Club Shell-O-Gram. To request an emailed copy write *Shell-O-Gram* editor Bill Frank at Strombus@classic.msn.com

OOPS!

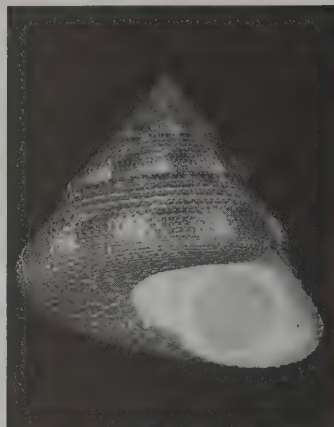
Our apologies to Irene Longley. It was she who was our devoted, hardworking, painstaking Captiva Convention Treasurer, and not her sister Vivienne Smith, as reported in the "Flowers To . . ." column in the September *American Conchologist*.

UNCOMMON AND ENDEMIC BRAZILIAN SPECIES

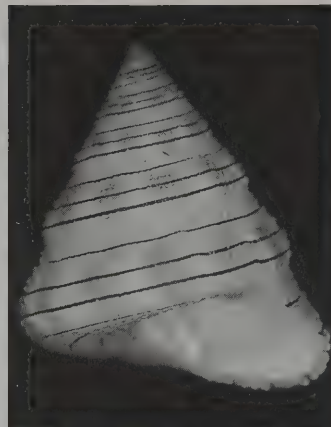
by José Coltro, Jr., Photos by Marcus V. Coltro



Perotrochus atlanticus Rios & Matthews, 1968. 72mm. Trawled, 180m off Santos, São Paulo.



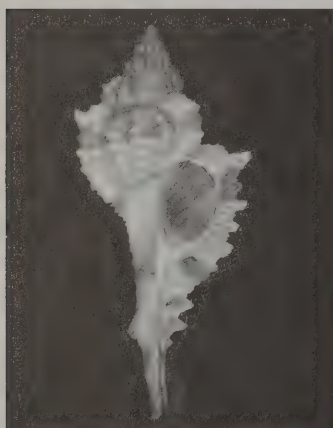
Calliostoma cf. *bullisi* Clench & Turner, 1960. 32mm. On rocks, 15-20m, Ilhabela, São Paulo.



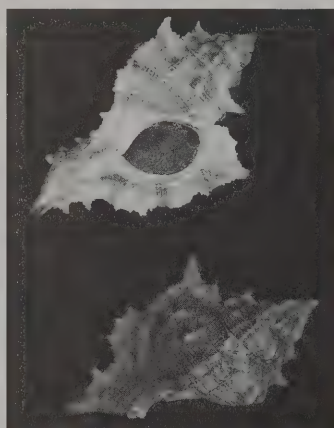
Calliostoma gemmosum (Reeve, 1842). 23mm. On coral, 20m, Guarapari, Espírito Santo.



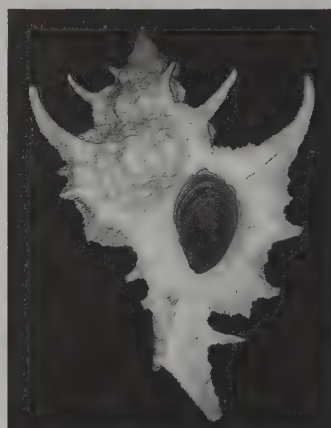
Calliostoma moscatellii Quinn, 1992. 25mm. Trawled 80-100m, off Rio de Janeiro. Paratype.



Chicoreus coltrorum Vokes, 1990. 45mm. Dredged 30m, Guarapari, Espírito Santo.



Chicoreus senegalensis (Gmelin, 1791). 57-62mm. In muddy sand at low tide, Guarapari, Espírito Santo.



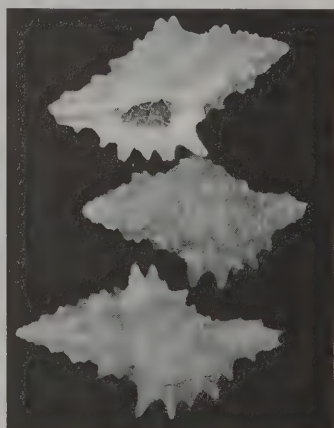
Chicoreus tenuivaricosus (Dautzenberg, 1927). 70mm. Trawled, 60m off Santos, São Paulo.



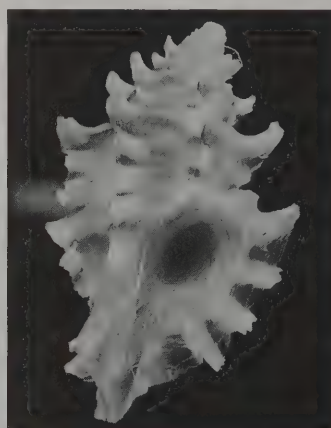
Coronium coronatum (Penna-Neme & Leme, 1978). 75mm. Trawled, 120-180m, off Santos, São Paulo.



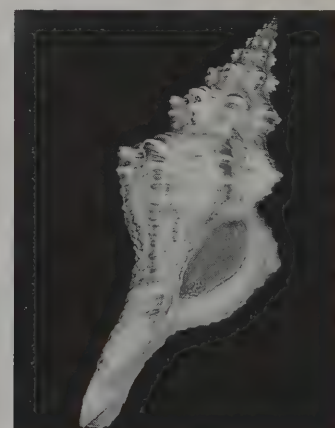
Favartia varimutabilis Houart, 1991. 8mm. Dredged, 20-30m, Guarapari, Espírito Santo.



Muricopsis josei Vokes, 1994. 21mm. Taken under rocks, 10-15m, Guarapari, Espírito Santo.



Pazinotus bodarti P.M. Costa, 1993. 10mm. Dredged, 20-30m, Guarapari, Espírito Santo.

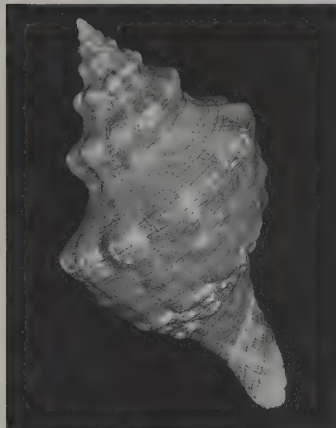


Fusinus brasiliensis (Grabau, 1904). 120mm. Trawled, 30-40m, off Vitoria, Espírito Santo.

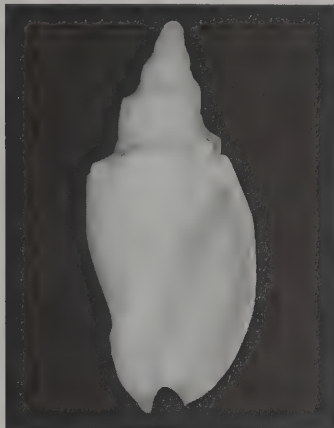
References:

- Abbott, R.T. 1974. *American Seashells*.
Calvo, I.S. & J. Coltro, Jr. 1997. Studies on *Odontocymbiola americana* (Reeve, 1856) (Mollusca, Gastropoda: Volutidae) with the rediscovery of *Odontocymbiola cleryana*

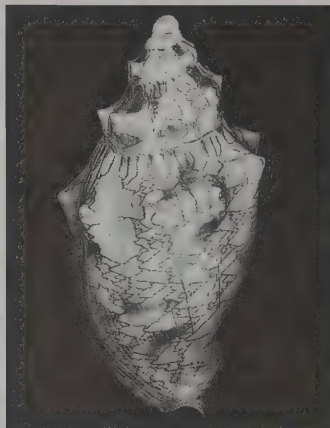
Disclaimer: The intent of these centerfolds is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



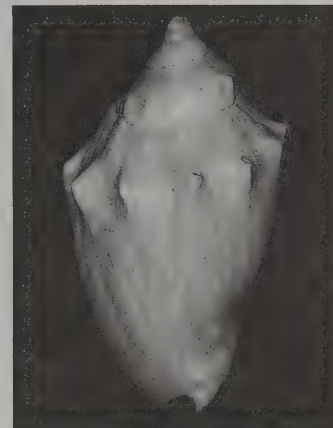
Pleuroploca aurantiaca (Lamarck, 1816). 120mm. Between rocks, 10m, Salvador, Bahia.



Odontocymbiola americana (Reeve, 1856). 48mm. Trawled, 40-45m, Vitoria, Espirito Santo. Albino form.



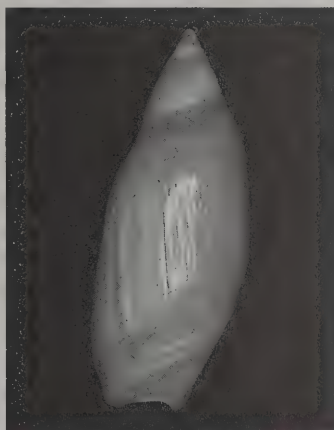
Odontocymbiola cleryana (Petit, 1856). 56mm. Trawled, 70-80m, off Santos, São Paulo.



Odontocymbiola saotomensis Calvo & Coltro, 1997. 65mm. 30-40m, off São Tomé, Rio de Janeiro. Paratype.



Plicoliva zelindae (Petuch, 1979). 32mm. In sand, 2-5m, Abrolhos, Bahia.



Amalda(?) dimidiata (Sowerby, 1850). 30mm. Trawled, 20-30m, Vitoria, Espirito Santo.



Turbinella laevigata Anton, 1839. 185mm. In sand, 15m, Salvador, Bahia.



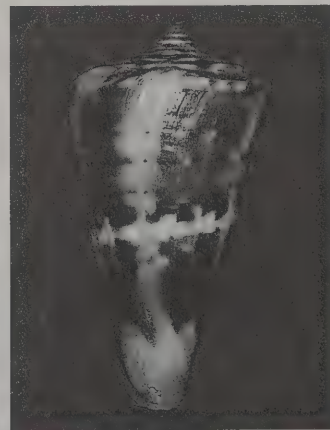
Vasmus cassiforme (Kiener, 1841). Left: 75mm, Salvador, Bahia; right: 70mm. Guarapari, Espirito Santo.



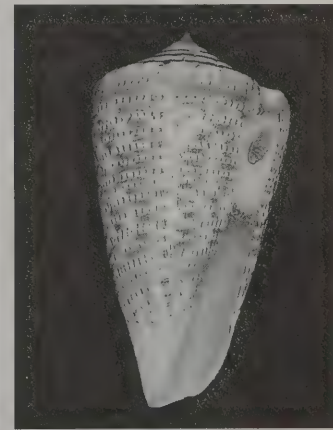
Conus brasiliensis Clench, 1942. 22mm. On algae, 1-2m, Guarapari, Espirito Santo.



Conus brasiliensis Clench, 1942. 20-21mm. On coral sand, 1-2m, Guarapari, Espirito Santo.



Conus carioca Petuch, 1986. 42mm. Trawled by nets, 40-45mm, Vitoria, Espirito Santo.



Conus xanthocinctus Petuch, 1986. 65mm. In coral sand, 30-35mm, off Macaé, Rio de Janeiro.

(Petit de la Saussaye, 1856) and description of two new species. *Vita Marina*, 44(3-4): 21-38.

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Dorothy flanked by Tucker and Cecilia Abbott in 1988.

Dorothy Raeihle 1909-1997

Conchology and malacology recently lost an able participant and dedicated friend. Dorothy Raeihle passed away June 24, 1997 at her West Babylon, New York home, amid the correspondence and papers and journals and collections that had consumed much of her life's interest. An amateur malacologist for nearly 50 years, Dot was proof that dedication to a cause, even without formal scientific training, can result in significant productivity. With her late husband George, a talented and prolific photographer, Dot contributed importantly. For years, on her kitchen counters an assortment of mollusks lived through their reproductive cycles in plastic refrigerator boxes. A pair of Florida murex lived for eight years, succumbing to neglect during Dot's hospitalization for a hip fracture. George and Dot traveled to beaches and bays to collect mussel spat and other carnivore goodies. Some of her shelly menagerie

were weaned to chicken liver scrapings on which they thrived. The Raeihle closets held great containers of filtered seawater for her aquaria.

Most important, however, were Dot's carefully recorded measurements and observations — these animals were subjects for study, not pets. Important milestones in their lives were photographed. Dot's articles have been published over the years in the *AMU Annual Report*, *New York Shell Club Notes*, and Long Island Shell Club's *Irradians*. She wrote about behavior, reproduction, eating habits and life spans, including significant observations on *Marginella apicinum* Menke and *Haminoea solitaria* Say. For several years Dot presented an "Educational Minute" at each Long Island Shell Club meeting, enlightening all with a carefully presented and illustrated talk.

George and Dot had belonged to the New York Shell Club since 1956. From 1960 on, Dot attended many AMU meetings, and was an AMU councillor in 1963-64 and 1969-70. Her term as editor of the *New York Shell Club Notes* was from 1961 until arthritis recently made it impossible for her to type; the *Notes* flourished under her meticulous attention, and she remained on the editorial staff until her death. Her constant research, correspondence with shell folks around the world, monitoring of the publications she received, and perfectionism are what made the *Notes* so highly respected.

The Raeihle home on an inlet of Long Island's Great South Bay welcomed local and visiting collectors, museum personnel and professionals, including Dr. William Emerson, Bill Old, Walter Sage and the D'Attilios and Abbotts. George was frequently called upon to photograph shells for presentations and publications. The American Museum of Natural History has recently accepted both George's important collection of nature slides and the shells, with hopes of incorporating both into the museum's material.

We are all proud of Dot and her courage. Despite poor health and limited mobility she was able to maintain her home and, with her positive spirit, to entertain her New York Shell Club friends. We shall all miss her laughter and her wisdom.

—Mary Ruth Foglino

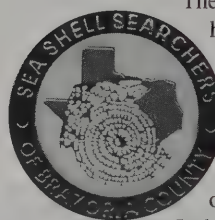
THE 1998 R.T. ABBOTT VISITING CURATORSHIP

The Bailey-Matthews Shell Museum is pleased to invite applications for the 1998 R.T. Abbott Visiting Curatorship. This Fellowship, established originally in accordance with the wishes of the late Dr. R. Tucker Abbott, Founding Director of Shell Museum, is awarded annually to enable systematic malacologists to visit the museum for a period of one to two weeks. Abbott Fellows will be expected, by performing collection-based research, to assist with the curation of portions of the museum's Mollusk Collection and to provide one evening talk for the general public. A large percentage of the records has been catalogued through a computerized database management system (MS Access). A substantial portion of the time will be available for research in the museum collection, but field work in SW Florida can be arranged. The R.T. Abbott Visiting Curatorship is accompanied by a stipend of \$1,500. Interested malacologists are invited to send a copy of their curriculum vitae together with a letter detailing their areas of taxonomic expertise and research objectives, and to provide a tentative title for their talk.

Applications for the 1998 Visiting Curatorship should be sent no later than January 31, 1998. The award will be announced by February 28, 1998. Materials and questions about the R.T. Abbott Visiting Curatorship should be directed to: Dr. Jose H. Leal, Director, The Bailey-Matthews Shell Museum, 3075 Sanibel-Captiva Road, Sanibel, FL 33957 USA. Phone: (941) 395-2233; fax (941) 395-6706

The Shell Store has moved. Just a block south and east of their former location, the Lipes can be found at 348 Corey Avenue, St. Petersburg Beach.

PIN MONEY



The Sea Shell Searchers of Brazoria County, Texas have a new shell club pin. Two sundials are superimposed on the outline of Texas. The club is offering them for \$5.00 each which includes postage within US. (\$6.00 for outside US) Orders with payment can be sent to: Sea Shell Searchers c/o Brazosport Museum of Natural Science, 400 College Drive, Lake Jackson, TX 77566.

Founded by R.M. Dixon of Rochester in 1972, and growing from 6 members to about 160, the British Shell Club celebrated their 25th Anniversary Show on Saturday, Oct 25th. There are only two annual events: the April convention (25/4/98), and an October Shell Show (31/10/98). Visitors are always welcome. To mark the BSC's 25th Anniversary and to help club funds an attractive Club Badge which depicts the Common whelk, *Buccinum undatum* in gold on a white background, is available from: Mrs Daphne Howlett, 6 New Inn Hill, Rockland St Mary, Norwich, NR14 7HP Norfolk, England. (From information provided by Stanley Francis)

A special symposium entitled "Conservation, Captive Care and Propagation of Freshwater Mussels" is scheduled for March 6-8, 1998 in Columbus, Ohio. For more information, contact the Editor.

The French "10th Paris International Shell Show" will be held Jan 31 and Feb 1, 1998. Information, M. & D. Wantiez, 88, Rue du General Leclerc, 92510 St. Gratien, France. Phone: 01 34 17 00 39

BLINDED BY THE COLOR

by Ross Gundersen

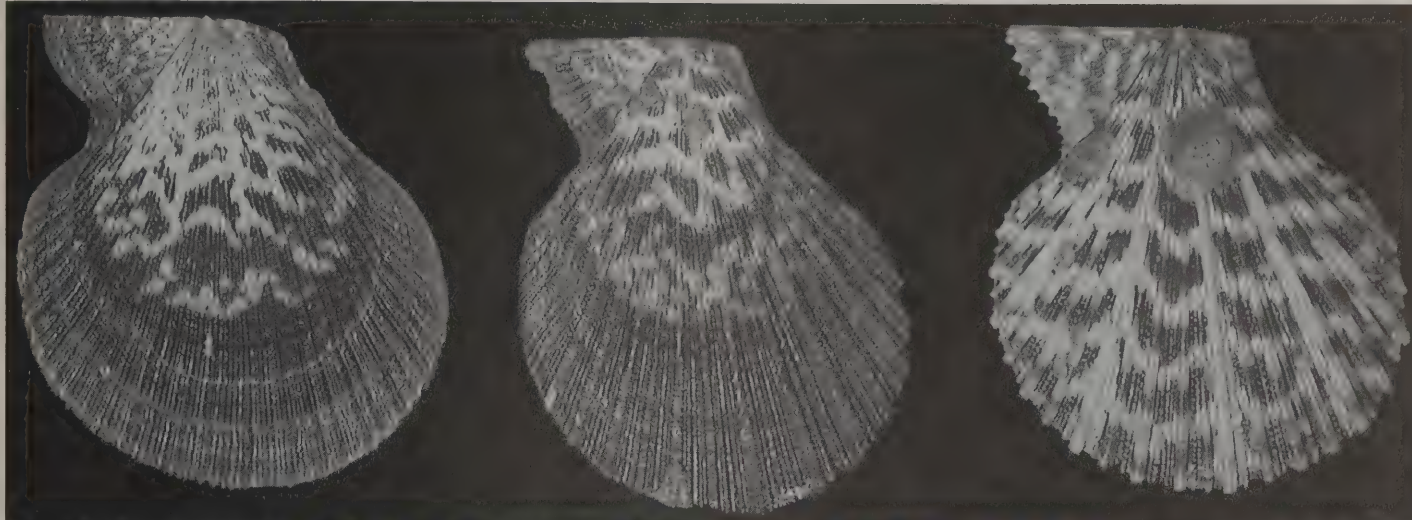


Figure 1: Upper valve of *C. sentis* (left), *C. ornata* color form (middle) and *C. ornata* (left).

Two pectens routinely encountered in the Florida Keys and Caribbean are *Caribachlamys sentis* (Reeve, 1853) and *Caribachlamys ornata* (Lamarck, 1819). They are typically found under rocks near coral reefs or reef-like structures. Both are strikingly handsome pectens which deserve a prominent place in any western Atlantic collection. The upper valve of *C. sentis* can be colored orange, maroon or dark purple, and white. The colored specimens exhibit some white markings near the beak. *C. ornata* typically is shown with the upper valve having a white background upon which are arranged maroon maculations that are more prominent near the beak. Identification can usually be accomplished roughly by comparison with pictures found in identification guides.

During the last 10 years I have had the wonderful opportunity to do extensive collecting at Hofstra Marine Laboratory, Priory, Jamaica. I have found many beautiful dead pairs of both *C. sentis* and *C. ornata*. Since I am more inclined to be interested in gastropods I simply picked them up and roughly categorized them as *C. sentis* or *C. ornata*. During the process of cataloging my collection I looked at these specimens again and was perplexed by the appearance of certain specimens which I had labeled as *C. sentis*. They were the expected solid maroon or orange in color with white markings near the beak. Superficially they appeared to be *C. sentis*. Closer inspection revealed that the radial ribs on the upper valve were not as numerous or as heavily scaled as

expected for *C. sentis*. In fact, most of the ribs were arranged in obvious groups of three, with the centermost rib being obviously larger. The radial ribs on the upper valve of *C. sentis* are more numerous, with every fourth rib being slightly larger.

I had found specimens of *C. ornata* which had the coloration of *C. sentis*! In addition, some of the individuals could not make up their minds on coloration. They were regionally marked with a varied mixture of maroon and orange. These intermediate color forms between *C. sentis* and *C. ornata* have already been observed by Thomas Waller (1993. Evolution of Tropical American "*Chlamys*," *Amer. Malac. Bull.* 10(2)).

Now I can appreciate why those identification books have those wonderfully dry, boring, and sometimes lengthy descriptions of shells. While color and color patterns can be useful in identifying a shell, these colors can vary regionally, giving rise to what are called ecophenotypes. In this case what is more important are other characteristics of the shell such as ribs, scales, foliations, columellar folds, beads, threads, cords, etc. *ad nauseum*. Now when I find new shells I appreciate their color and then break out the hand lens and manual of conchological terms and end up spending some satisfying time really getting to know and appreciate the shells I am hopefully identifying.

I would like to thank Carole Marshall and Bret Raines for assisting in the identification of the color forms of *C. ornata*.

Department of Biological Sciences, Wisconsin University, Parkside, Box 2000, Kenosha, WI 53141 Email: ross.gundersen@uwpx.edu

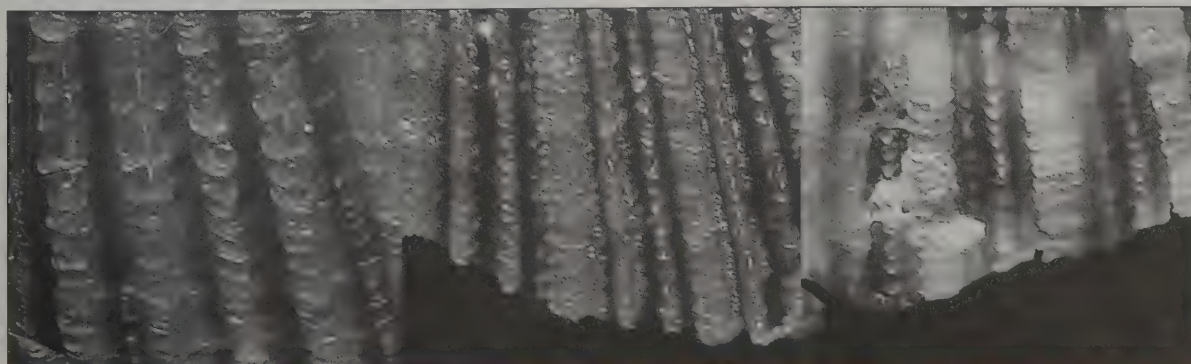


Figure 2: Detailed view of the scales and rib arrangement of *C. sentis* (left), *C. ornata* color form (middle) and *C. ornata* (left).

STEVE TURRE: SHELL MAESTRO

by Marjorie Hoachlander



The Maestro with his *Syrinx aruanus*.

As most shell collectors are keenly aware, there are so many ways to appreciate the beauty and the value of shells. To serious collectors, they are nautical treasures to collect, study and display. To recreational seekers like me who live year round by the sea and also often vacation there, shells are what we find when we walk on the beach or browse in a souvenir shop. We tend not to focus so much on size, shape or species name, but we pay considerable attention to the outside appearance and coloration of the shells we keep.

There is, however, a way of perceiving a shell that we have all probably had in common since we were children: holding the under side of it close to the ear to hear the rushing, ocean-like sound that comes from within it. Each time we do this we feel a sense of wonder mingled with curiosity, but nothing so profound as what is felt by the stellar jazz trombonist, composer and arranger, Steve Turre, when he blows *into* one. From his point of view as a musician, the sounds that come from playing a shell are its most compelling features.

After many hours of experimentation and practice, Turre has learned how to use many kinds of natural seashells as full-fledged musical instruments in his jazz orchestra. He can make them play and sing in unison or in harmony, according to how he wants them to perform.

To turn each one into a musical instrument, Turre first must saw off the apical end. With acrylic plastic he builds up the cut edge to form a mouthpiece similar in size to the one on his trombone. Only then is it ready to be blown. Each shell can produce a primary tone. The larger shells have a lower pitch, the smaller ones, a higher pitch.

As certain notes are called for in arrangements being performed, Turre reaches over to a table by his side that holds an assemblage of shells. He picks one up, blows into it, then picks up one after another in rapid succession, according to the phrasing, holding each shell in one hand and manipulating it with the other. By inserting his hand into

a shell, Turre can lower the pitch chromatically from its primary tone. Over time, he has become technically aware that most shells have an interval of a fourth, some shells, the range of a sixth or more, whereas the largest shells usually have a third.

While he's playing the shells, Turre's entire body sways, crouches or turns in keeping with the beat. With split-second deliberation, he releases a hand from a shell, then swirls it around to cue the musicians in the group, some of whom are accompanying him on other shells. There is a saying that the best way to enjoy jazz is to *watch* it. That is why, in many respects, a Turre concert defies verbal description. It must be seen as well as heard to fully comprehend the technical and physical aspects involved.

Turre's passionate interest in shells was inspired when, as a teenager in the San Francisco Bay area, he was engaged to play with an eccentric saxophonist, the late Rahsaan Roland Kirk. "He always brought in strange kinds of instruments, and in 1970, he brought a shell. He only blew one note on it, but I loved the tonal quality. It was so warm and full and peaceful," Turre recalled when we met for a conversation after a concert in Chicago. "Hearing this started me twenty-seven years ago on — well, call it an odyssey. I explored the ancient sounds of shells and taught myself to apply them to modern rhythmic patterns."

It was late, but he knew I had come a long way to hear about this, so he went on. "As I roamed around, I began collecting shells from all over the world." I guess I have more than 50 by this time, but I keep adding more. Now, keep in mind that the shell, along with the animal horn, is the root of all brass instruments. Before metal was available, even before there was written history, the shell was a natural channel for human breath. I discovered that shells were played mostly by people who lived in the warm parts of the globe — between the Tropic of Cancer and the Tropic of Capricorn — because the shells grow big enough there to become practical instruments in addition to being a source of food," he explained. "In Polynesia, they were used to announce the king or chief. In southern Japan, a shell (*Horagi*) was played for meditation. In India, they were used at the Kali Temple (I went there while on tour) at dawn and dusk to call for prayer. The



Steve Turre (on Queen Conch) and the Sanctified Shells
Photo by Jules Allen

Indian shell is different from all others I've heard . . . has an unusual tone. In the Caribbean, even today, the fishermen play a call when they're docking after a successful catch — to announce it so that people will come and buy."

Paying the way for these journeys, he told me, were professional engagements with the Ray Charles Orchestra, Woody Shaw, Art Blakey and the Jazz Messengers, the Thad Jones/Mel Lewis Big Band, Dizzy Gillespie and McCoy Tyner. "On such 'gigs,' I played my shells at every opportunity, but it was during a period with Manny O'Quendo's Libre, a Latin jazz band, that my solo concept on the shells truly came into focus. It was based on a relationship of the sound of the shell with the hand drum. From then on, I developed my technique, and audiences began to like what they were hearing."

In 1978, while he was performing with Woody Shaw in Mexico City, some of Turre's relatives came to hear him. "After the concert, I went to their house," he reminisced with obvious pleasure. "They told me that our ancestors used to play sounds on the seashells. Then I went to Teotihuacan, and I saw a carving on the way of this Aztec priest playing one." Deciding to build upon his Mexican-American heritage, Turre began to play the shells with more dedication and make his own tradition. He trained six other brass players and organized a Shell Choir that was featured at first on experimental compact disc, *Sanctified Shells* (Island/Antilles, 1993), then later, on the widely acclaimed CD, *Rhythm Within* (Island/Antilles, 1995).

In his most recent self-titled release, *Steve Turre* (Verve, 1997), this innovative musician has achieved full assimilation of shell sounds through arrangements that involve not only trombones, trumpets, African and Cuban percussion, piano and trap drums, but also saxophone, guitar, vocalists, mallets — both marimba and vibraphone — augmented by a string quartet led by his cellist-wife, Akua Dixon. "That was an exciting mix of talent — 31 musicians in all — the most challenging recording I've done so far."

"Now that you've shown your peers and the public that these natural instruments have a place in modern jazz, are you planning to con-

tinue working with them?" I asked hopefully.

I feel that I'm supposed to be doing this, so I'll keep it up," he replied. "My shells are a part of me."

At that moment I thought of a question that a novice shell player might want to ask. "How do you control the range of tones so that you'll be sure each one comes out on pitch?"

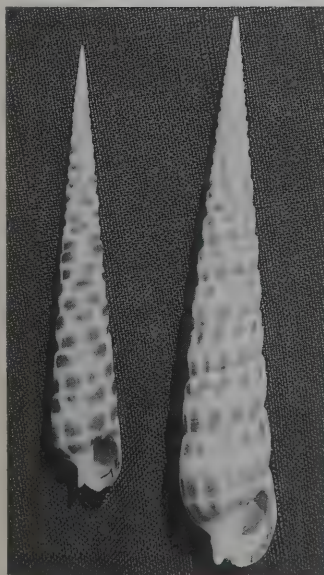
A teasing smile came before a thoughtful answer. "How do you think I do it with the slide on my trombone? It's the same principle. You put your hand in and out of the shell to change the pitch, and you must learn to move your hand to the pitch. It just takes a lot of practice."

Then he reached into a sports bag that he had beside him and pulled out the largest shell I had ever seen. "Here. Try it."

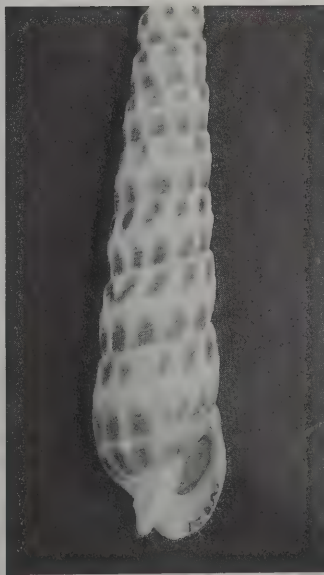
It seemed amazingly lightweight in my hands. Wondering if I would be leaving lipstick on the mouthpiece, I blew a low, but lovely, sound. As in years before, I felt that same childlike wonder. Only this time, more so, because the shell and I had made the sound together.

The music of Steve Turre and his Sanctified Shells is a riveting visual experience. Those who are interested in knowing where and when this group is performing can find its touring itinerary on the Internet: <http://www.verveinteractive.com/tour.html> Currently, when he's not on tour with his own group, he plays his trombone on NBC's *Saturday Night Live* television broadcasts and in concert with the Carnegie Hall Jazz Band.

Dr. Marjorie Hoachlander, President and Founder of The Coastal Jazz Society in Atlantic Beach, NC, has been following the musical career of Steve Turre since she became mesmerized by the sounds of his Shell Choir four years ago. In partnership with the local arts council and community college, the Society brought Steve Turre and the Sanctified Shells to perform for Concert '97 last summer in Morehead City. The perceptions of that audience will probably never be quite the same.



T. achates. Left: from Indonesia, 84.7mm. Right: from Tonga, 103.6mm.



Aperture of Tongan *T. achates*.

Terebra achates Weaver, 1960: a geographic extension

by Emilio F. Garcia and Loretta Marr

On a visit to Jakarta in 1985, the first author obtained from the well-known Indonesian collector, Bunjamin Dharma, an unknown *Terebra*, later identified as *T. achates* Weaver, 1960. The specimen, which had not been personally collected by Mr. Dharma, had as data "Rambut I., Indonesia." Since this species was regarded to be endemic to Hawaii, he thought that the locality was somehow erroneous.

Coincidentally, that same year, as the second author and her son Tommy were collecting between Oneata Is. and Nuku'alofa, Tonga, Tommy collected in 2' of water, following a trail, a large *Terebra* which also turned out to be *T. achates*. There is absolutely no doubt about the locality of this second specimen.

The Indonesian specimen measures 84.7mm and the Tongan specimen, 103.6mm.

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DO SPOTS EQUAL STRIPES?

by Ross Gunderson and Russell Minton

In 1996, Ross Gunderson and Russell Minton were the first recipients of COA's Walter Sage Memorial Grant. Their work on the color patterns in *Neritidae* is reported in the following account.

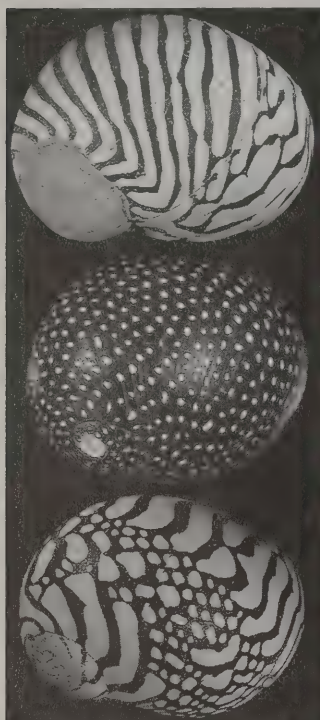


Figure 1. above: *Puperita tristis*; center: *P. pupa*; below: intermediate form.

As recipients of the Walter Sage grant, we are interested in the dynamic and seemingly limitless array of shell colors and patterns. In the March, 1997 issue of the *American Conchologist*, Gary Rosenberg provided us with a thorough survey of why shells may have color. The following article represents part of the work we did in studying *Puperita pupa* and *P. tristis*, two species of snails, as part of our proposal: Do Stripes Equal Spots?

Every year, along with a dozen or so students, we visit the Hofstra University Marine Laboratory in Priory, Jamaica to conduct a field marine biology course. During a visit to Jingle Beach, a small cove west of the lab, we found some black snails whose shells were decorated with small white dots. These snails were living in the surf zone where a fresh water spring issued from cracks in the limestone shoreline. We casually identified the snails as *Neritina punctulata* because they were essentially living

in a flowing freshwater environment.

The next year we found more of these snails living in isolated pools above the tide line, an environment which is not usually associated with flowing fresh water. However, since the snails appeared identical to one another, we decided to run some salinity tests. These tests showed that these isolated pools contained nearly fresh water. At this point we knew that something was wrong with our identification, because of *N. punctulata*'s association with flowing fresh water. This time we collected some of these snails and correctly identified them as *Puperita tristis*, the Melancholy Nerite (Figure 1, above).

Near these *P. tristis* were *P. pupa*, the Zebra Nerite (Figure 1, center), living in pools at the tide line. These snails did not look like the "normal" *P. pupa* found elsewhere, because they exhibited black lines which split and crossed, giving the shell a netted appearance. They looked like an intermediate between *P. pupa* and *P. tristis*, not entirely one, but not entirely the other (Figure 1, below). The pools where they occurred provide variable environments, ranging from fresh to hypersaline water, depending on sunny or rainy weather. The two snails weren't found in the same pools, but occurred very close to each other. And so a second something wasn't right. Here were two different species, living near one another in variable environments. The *P. pupa* looked different than we expected, and the *P. tristis* were located right next door in essentially fresh water.

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Russ Minton: University of Alabama, Box 870345, Tuscaloosa, AL 35487 Email: minto001@bama.ua.edu

We had previously reviewed the taxonomic history of *P. tristis*, which suggests that it may be a subspecies or a color form of *P. pupa*. Russell, in his cataloging of the western Atlantic *Neritidae*, suggests the two species maintain their separate standing based on radula, size, and pattern differences. He does note, however, that there are occasional color pattern intergrades between *P. pupa* and *P. tristis*.

We had a hunch that the salinity of the pools might be important, that this salinity could be the reason the *P. pupa* looked different. Maybe there was freshwater seeping into a few of the spray pools, lowering the salinity and causing the *P. pupa* to look netted. What if the salinity was lowered even more? Might the black lines cross and fork to a greater extent, making the shell look black with patches of white? If so, would there then be any difference between these snails and the *P. tristis* we had found? Based on what we saw and our hunch, we decided to do some experiments.

We found a meter-deep pool containing *P. tristis* to serve as our experimental site. The pool is protected on three sides by a rock, and is easily overlooked. About fifteen feet from this pool we located some net-patterned *P. pupa* living in a spray pool. We grabbed about twenty of each species, placed them into the pool of the other species, and let the mixed group go about their business. We were lucky to have planned two trips that year, the second coming three months after the first. During the second trip, we eagerly went to Urchin Cove, relocated our site, and looked for the transplants. There they were! They had survived the change in environment and had grown, which was a positive sign. Most exciting were the areas of new shell growth. As the snails grew, their new shell had the color and pattern of the other species normally found there (Figure 2). The *P. pupa* had a band of white-spotted black at their edges, and the *P. tristis* had a band of the netted white. The changes were immediate and abrupt. There were clear delineations between the two patterns. The areas of new growth were small, but very distinct.

We had now seen individuals in this area switch patterns, and now were next out to test whether the switch was a local phenomenon or a more widely spread one. We took typical *P. pupa* from a quarter mile west of the experimental site and put them in with the *P. tristis* in the experimental pool. We chose not to transplant any *P. tristis* out to this new site, because after a few months they would be almost impossible to find. The experimental pool serves to contain the individuals to some extent, while in the spray pools, the snails easily could travel enough distance to make finding them very difficult. We left these other *P. pupa* to grow until our next visit, nine months later.

We found our transplanted *P. pupa* that next year, and they had undergone the same pattern change as the first group to be moved (Figure 3). The new shell growth was black with white spots, and there were clear and abrupt delineations between patterns. The additional six months of growth had made the pattern differences even more striking. Through some simple manipulation, we had



Figure 2. Transplanted *Puperita* after three months.

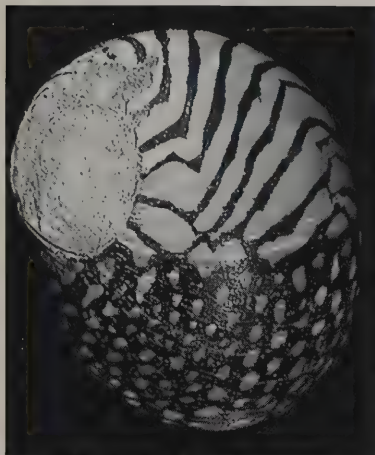


Figure 3. Transplanted *Puperita* nine months later.

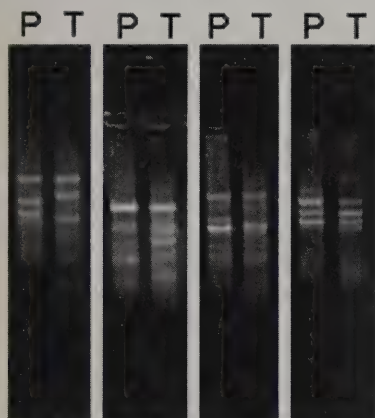


Figure 4. DNA fingerprints of *P. pupa* (P) and *P. tristic* (T).

helped produce snails with patterns that were half *P. pupa*, half *P. tristic*.

These simple experiments had supported the link between salinity and color pattern. *P. pupa* were found in pools of high salinity, and *P. tristic* were found in pools of low salinity. When the snails were switched into pools of differing salinity, their patterns changed to that of the other species. This suggests that environmental salinity may be one factor affecting shell color and pattern.

We decided to go one step further in testing the similarities between *P. pupa* and *P. tristic*. Using some molecular techniques, we analyzed the DNA from both species. As you may know, DNA is the 'molecule of life', and carries the information on how an organism will be put together, what it will look like, and its capabilities. Research has shown that two organisms with similar DNA often bear strong resemblance to one another in terms of body plan, metabolic processes, and physical features (e.g. family

members). If *P. pupa* and *P. tristic* are one snail masquerading as two

species, then their DNA should be similar. We studied their DNA using the randomly amplified polymorphic DNA technique (RAPD), a method which gives DNA 'fingerprints'. Each fingerprint is comprised of many bands which represent pieces of DNA of different sizes. These bands are easily visualized on gels with ultraviolet illumination. Looking at each set of fingerprints in the figure, you can see that *P. pupa* and *P. tristic* share many bands (Figure 4). In fact, there are a great many more similarities between the two species than there are differences. We ran these results through some vigorous statistical tests, and found that the fingerprints for both species were nearly identical. This suggests that *P. pupa* and *P. tristic* may be the same species.

So where does that leave us? From these very basic studies, we believe that *P. pupa* and *P. tristic* may be one species exhibiting ecophenotypic variation — looking different in different environments. Our results are very much experimental, and we have many more studies to do before we can say anything concrete. It appears that salinity is a factor determining the appearance of the shell, but the literature lists numerous other factors for which we did not control, that affect shell color and pattern. We have shown that *Puperita* from a single area in Jamaica can switch, but whether it is a species-wide phenomenon is yet to be determined. We have since received some unique *P. pupa* from Ohio Key in Monroe County, Florida, which are of great interest because they don't resemble normal *P. pupa* or *P. tristic* (Figure 5). One day we hope to study the environment there, to see if these individuals are being presented with a unique set of circumstances which are dictating this unusual pattern. In our case, at the very least, we feel that stripes just may equal spots.

We would like to personally thank the COA for funding this research.



Figure 5. Ohio Key specimen.

Unitas Malacologia in Washington in July

For the first time, the American Malacological Union and the Unitas Malacologia will meet jointly, along with the Western Society of Malacology in Washington, DC. Many malacologists from outside of North America are expected to attend this meeting, July 25-30, 1998, and you are urged to participate in what surely will be a unique meeting. The meeting site is the Smithsonian Institution on the National Mall.

In addition to contributed papers and posters, three plenary symposia are: "Refining Molluscan Characters," "Interactions Between Mollusks and Humans," and "Bridging Temporal Scales in Malacology: Uniting the Living and Dead."

Participants are asked to pre-register by mail by March 1, 1998. For more information, write: Eugene P. Keferl, WCM Registration, Dept. of Natural Sciences & Mathematics, Coastal Georgia Community College, Brunswick, GA 31520-3644 USA. OR See the Unitas Malacologia website where full information and registration forms are available: <http://www.fmnh.org/wcm/>

Featured special events are the Sunday evening reception at the National Museum of Natural History Rotunda, an Evening Dinner Cruise on the Potomac, the AMU Auction, and a field trip to the Chesapeake Bay Miocene fossil beds at Calvert Cliffs, Maryland.

American Museum Appoints Cordeiro

The American Museum of Natural History announced in late August that James R. "Jay" Cordeiro has been appointed as Collections Manager of the Department of Invertebrates. Jay received his Master's degree in Museum Studies under Dr. Shi-Kuei Wu at University of Colorado in March 1997 and has interest and expertise in freshwater mollusks. As assistant to Dr. Paula Mikkelsen, he has primary responsibility for the mollusk collections, and also oversees all other fossil and Recent invertebrate collections in the department. Jay may be reached for collections inquiries, applications for Visiting Scientist funds, and other collections-related needs, at 212/769-5720 or cordeiro@amnh.org.



In Memoriam

Laurelle Cole
 Anthony D'Attilio
 Bobbette Fleschler
 Leonard C. Hill
 Pete Lee
 Ingrid Meyer
 Dr. Donald Moore
 Henry H. Nunokawa
 Pete Rosin
 Jeanette Tallman

Donald Richard Moore

Dr. Donald R. Moore passed away suddenly on Sunday, October 19, 1997 in Miami, Florida. He was Professor Emeritus of Marine Geology and Geophysics at the University of Miami's Rosenstiel School of Marine and Atmospheric Science (RSMAS) in Virginia Key, Florida, having published mostly on marine micromollusks of the families Vitrinellidae and Caecidae, and on the biogeography of assorted tropical western Atlantic mollusks.

A member of COA, he was a strong supporter of shell clubs and non-professional shell collecting, helping create the Greater Miami Shell Club, and having judged innumerable shell shows in South and Southwest Florida. Don was an active member of American Malacological Union since the early sixties, holding the posts of Councillor-at-large in 1968-69, Vice-President in 1974, and President in 1975, and serving as past president several times. He was a strong supporter of *Unitas Malacologica* as a world-wide organization, and was a member of the scientific committee that helped create in 1990 the successful Committee for Latin-American Congresses. Although Don had been technically retired since 1984, he was always present at the major malacological meetings in the US, Europe and Latin America, and was a key player in the academic life at RSMAS and South Florida in general.

Don, who was one of my professors and my advisor at RSMAS in the late 1980s (as well as friend for life and unconditional supporter), is deeply missed by his family, friends, colleagues, and students. His wife Cynthia and son Walter suggest that contributions in his memory should be made in the form of donations to the Rosenstiel Alumni Scholarship Fund in Dr. Donald R. Moore's name. Don's love for life, gentle demeanor, and subtle sense of humor will always be remembered by those who knew him.

—Jose Leal

1998 WINTER & SPRING SHELL SHOWS & OTHER EVENTS

Donald Dan, COA Awards Chairman

- Jan. 17-18 **ASTRONAUT TRAIL SHELL SHOW**, Melbourne, FL
 Jim & Bobbi Cordy, 385 Needle Blvd.
 Merritt Is., FL 32953 (407) 452-5736
- Jan. 23-24 **GREATER MIAMI SHELL SHOW**,
 Fontainebleau Hilton at Miami Beach, FL
 Lilian Shin, 14913 SW 104th St. Apt. 24
 Miami, FL 33196 (305) 388-1467
- Jan. 30 - **BROWARD SHELL SHOW**, Pompano Beach, FL
 Feb. 1 David Kempfer, 1685 NW 65th Ave.
 Margate, FL 33063
 E-Mail: SEANOTES@AOL.COM (954) 970-3636
- Jan. 31 - **X^{ème} RECONTRES INTERNATIONALES DU COQUILLAGE**
 Feb. 1 Paris, France - M. & D. Wantiez, 88, Rue du General Leclerc
 95210 Saint Gratien, France (1) 34-17-00-39
- Feb. 6-8 **S.W. FLORIDA CONCHOLOGICAL SOCIETY
SHELL SHOW** Ft. Myers, FL
 (Non-juried event this year) Edith Chippeaux,
 1308 Biltmore Drive, Ft. Myers, FL 33901 (941) 936-4058
- Feb. 20-22 **SARASOTA SHELL SHOW**, Sarasota, FL
 Peggy Williams, P.O. Box 575, Tallevast, FL 34270
 E-Mail: SHELLELEGANT@MINDSPRING.COM (941) 355-2291
- Feb. 20-22 **NAPLES SHELL SHOW**, Naples, FL
 Howard & Susan Roux, 152 Coral Vine Drive, Naples, FL 34110
 E-Mail: CONCHMAN@NAPLESNET.COM (941) 514-0541
- Feb. 27 - **ST. PETERSBERG SHELL SHOW**, Treasure Is., FL
 Mar. 1 Bob & Betty Lipe, 440 75th Avenue
 St. Petersburg Beach, FL 33706 (813) 360-0586
 Website: WWW.Geocities/RainForest/Vines/3910
- Mar. 5-8 **SANIBEL SHELL SHOW**, Sanibel, FL
 Vi & Jon Greenlaw, 2813 SW 43rd Lane, Cape Coral, FL 33914
 E-Mail: JSG@ILINE.COM (941) 542-0935
- Mar. 12-14 **MARCO ISLAND SHELL CLUB SHOW XVIII**, Marco Is., FL
 John Maerker, 365 Henderson Court
 Marco Island, FL 33937 (941) 394-3438
- Apr. 11-12 **2ND NATIONAL AUSTRALIA SHELL SHOW**,
 Sydney, Australia
 Des Beechey, 26 Malga Avenue, Roseville, NSW 2069 Australia
 E-Mail: DES@PHM.GOV.AU (2) 9417 4980
- Apr. 19 **NOTE!**
PACIFIC SHELL CLUB SHOW HAS BEEN CANCELLED.
 Frank Jewett, 1739 Vallecito Drive
 San Pedro, CA 90732 (310) 519-8889
- Apr. 24-26 **GREATER ST LOUIS SHELL SHOW**, St. Louis, MO
 Kathy Krattli, 312 Capri Drive
 O'Fallon, MO 63366 (314) 272-4266
- May 2-3 **VIII BELGIUM INTERNATIONAL SHELL SHOW**,
 Aarschot, Belgium
 R. De Roover, Vorsterslaan 7
 2180 Ekeren-Donk, Belgium (3) 644-3429
- Jun. 20-21 **XVII^{ème} SALON INTERNATIONAL DU COQUILLAGE**,
 Lutry, Switzerland
 Dr. Ted W. Baer, CH-1602 La Croix Switzerland
 (21) 791-3771; FAX 792-1411
- June 26-28 **JACKSONVILLE SHELL SHOW**, St. Augustine, FL
 Billie Brown & Charlotte Lloyd
 1010 N. 24th St. Jacksonville Beach 32250
 Email: clloyd6888@aol.com 904-246-0874

2620 Lou Anne Court, West Friendship, MD 21794, U.S.A.,
 Tel. (410) 442-1242 or 442-1942 E-Mail: DONALDAN@AOL.COM

A GENERIC PRIVATE EYE

featuring Waldo Dacosta,
the Taxonomic Gumshoe

by Paul Monfils

The rhythmic strains of *CARDITA* blared from the radio as the TV commentator shouted "Ball three!" *WALDO DACOSTA*, reclining in his office chair, was oblivious. He had followed up a *TONNA* leads, but *BELA SULTANA* was *STILLA* threat to the city. The famous eyebrows looked *BUSHIA* than usual as he gulped down the last mouthful of cold *LIMA* beans, chasing them with a *SLUG* of *PETRICOLA*. He leapt to his feet, sending a potted *IRUS* crashing to the floor, as *HERMES*, his fox *PTERIA*, scooted for cover. "*BALFOURIA*!," the commentator intoned.

The door cracked a *BITTIUM*, allowing a *CINGULA* shaft of light to pierce the smoke-filled room. "*COMINELLA*," he called, without shifting his *GAZA* bit toward her. Ella *VIANA*, his assistant of fifteen years, surveyed the scattered shards. *TRUELLA*, he called her, always there when he needed her. Yes, he had to *RAETELLA* one of the best, a real *GEMMA* guy like him didn't deserve. "Come on, *STANDELLA*," he said, "I'll pick that up — thing was practically dead anyhow!"

"Well," she retorted, "you have to *PRUNUM* once in a while.

"Hey, Ella, you got any *MORICANDIA* want to share?"

Her tone became stern. "Wally, you know that's not good for your *ROTUNDARIA*. You're getting *OBESULA* every day!"

"Okay, okay," he agreed reluctantly, "then *PILA* banana for me. You know, I just gotta *PINNA* rap on this guy. He burns down the *BANKIA*, and we got *AMAEA* who won't even admit it's *ARSINELLA*! And now another victim — the town's becoming a *BATILLARIA*! By the way, the cops list this guy as Max — *MAXWELLIA*. I think he changes his name to stay *OBSCURELLA* — but call 'im Max or *COLUMBELLA*, he's *STILLA PUKALOA* who would just as soon *DRILLIA* as look at ya! The *NIRVA* that guy!"

She drew a mug of java from the *PECULATOR*. "Here Wally, remember your blood pressure!" Indeed his *DIASTOLE* had precipitated a bout of *ENGINA* a week earlier.

"Thanks, you're a good *PERSONELLA*.. How about a little game of *UNIO*," she suggested.

"No, I can't engage in *TRIVIA* now," he mumbled, "besides, I'm not feeling too *LUCIDELLA*."

"Another bout of *GASTROPTYCHIA*?," she inquired.

"Yeah, I think so — my *CAECUM* is on fire, and my *GLANS* are swollen. Could be *FLUELLA* — hope it ain't *TYPHIS*."

"Well," she chided, eyeing the empty bean can, "This ain't exactly *GOURMYA* food you been eating!"

"Well, if I could *ADMETE* to my diet," he murmured, "I wouldn't be so hungry all the time!"

"Here," she offered, "take a couple *MILAX*. These things are better than *PENICILLUS*. You'll feel more *MELO* once you get a *DOSINIA*.."

Dear *CALMELLA*, he mused, always a peaceful influence. A moment later he was on his feet. "Okay, better! That's *ABRANDA* medicine I'll remember!" He snatched the phone on the first ring. "*DACOSTA HERE*! Any *MESSAGERIA*? We got *ACESTA* the house? Good — that's *ASTARTE*! Okay, say *HYDATINA* for me!"

"*GARI*?," she inquired as he slammed the receiver down.

"Yeah, we're staking out *BELA* tonight."

"Oh Wally, he's a dangerous *ADVERSARIA*! Get some *EXTRA* help." He hesitated to *PONDA* her suggestion.

"Okay, *TRITONIELLA* — see if he can come." She started to *DIALA* number. "Yeah, he continued, "tell that *LOPHA* to get off his *HINEA* — I need him!"

"*HELOA* Tony! *HAWAIIA*? Me? I been *HAPPIA* ..." She covered the mouthpiece — "Tony'll do it for a hundred bucks."

"Ella, in my day someone needed help, *ABRA* cadabra, we were there! Today everybody's so *MERCENARIA* about everything!"

She hung up the phone. "All set — Tony *ANGARIA* going to meet you there."

WALDO pressed six *SHELLS* into the *CYLINDER* of his semiautomatic, strapped on his *TEXOSTELE* vest, and grabbed his jacket and gray *TUDORA*.. "Call the *LABELLA*, and see if they have anything on that last victim. I *CONJECTURA* quick-acting poison, maybe *RICINELLA*.."

She quickly made the call. "The *LABIS* still working on it — they'll have *CARACOLUS* as soon as they get anything."

"Okay," he yelled back as he sprinted out the door, "when the reports are ready, have her *SINUM* and *PHAXUS* a copy! Or else *GOCEA* and pick them up!" He dashed down the stairs and *LEPTON* the running board of the old *SEPIA COROLLA*, parked by the front door. Ow!, *EUNINELLA*!, he shouted, as his *PATELLA* struck the doorframe, sending a bolt of pain through his *TIBIA*..

What *ACAR* he thought, as the *TURBO*-charged, *BIVALVED* engine roared to life. Truthfully, the vehicle was *ARCHAICA*, but it had been *ASTELE* at eight hundred bucks. He stomped on the *ACELLARATOR* and roared off down *ESMERELDA* Boulevard.

"Yeah, nice setup," *GARI* observed, as he mounted the *TELESCOPIUM* on its tripod and adjusted the *LENS*, *AMPULLARIA* for all the equipment. "We got enough *TAPES*? Where's the recorder, Wally?"

"There's a nice *NUCELLA*," Wally replied, "I put it down there. Okay, now we just wait and watch. Wonder if there's a *BARNEA* here — I could use a rum and coke." They whirled around, guns drawn, as the door latch rattled.

"Hi guys, hungry?"

"*COMINELLA*," Tony laughed, "*EUBRANCHUS* food? Bless you!"

Wally was not amused. "Ella, you shouldn't be here! This is strictly a *MANARIA*. *SCURRIALONG* now — and don't *LINGA* — they see ya, they'll *CHACEIA*! Get away from here, and I mean *PHARELLA*!" She left promptly.

"Geez," Wally stormed, "sometimes that girl has no sense at all!"

GARI smiled knowingly, "So whatcha gonna do, *DISSONA*?" The latch clicked again.

"Ella, I told you..."

"Well now, what have we here," intoned a raspy male voice. They turned to confront a short, stout man flashing a wide toothy grin. From a heavy gold chain around his neck hung a huge *AMETHYSTINA GEMMULADORNED* gold mount. His right hand grasped a tiny gold pistol. Clinging to each arm was an attractive woman in a glittering, slinky sheath — as *EXOTICA* pair of human *ORNAMENTARIA* as you could imagine, striking poses that could only be described as *PROVOCATOR*.

"*SULTANA*!" whispered Wally under his breath.

"*FELICIA*, *LEILA* — say *HALOA* to the nice detectives."

Wally stepped toward the imposing figure, "What are you planning, *BELA*?"

"Quite the *INQUISITOR*, aren't we," the armed man rejoined, "*CLOSLIA* mouth, *DACOSTA*. I got a plan, all right — *PITYS* you won't be around to see it! Thought it might be hard to *TRICHIA* — but you ain't so smart after all."

The door opened wider, revealing another, larger man. "Hey boss, look *HERE* — *ISSENA* sneakin around outside."

"Oh no!" Wally thought, a knot tightening in his stomach.

SULTANA approached her, face to face, "*MYURELLA*, ain't ya?" he cracked.

"Better believe it, *PALIO*," she snapped back. "Wow," she thought, "What a case of *HALIOTIS*!"

"Couldn't be *SASSIA* either," he mused.

"I'm *TELLIN* you, she's not involved — let her go," Wally pleaded.

"Thought I told you to *CLAM* up," *BELA* croaked. Then, gesturing toward his massive body guard, "Meet *HERCULEA* — but you can call him Hoss. Hoss is gonna teach you your final *LESSONINA* minute anyway, so go ahead, *SPEKIA* piece, if you *ENSIS*."

Wally's mind raced — a bluff! "Six more guys will be here shortly to *PROTECTUS*," he stammered.

"Don't try to *CONUS*," *BELA* sneered, "*HAUSTELLUM* what happens when they double *CROSSEA*!" The big man stepped forward and swung hard. As Wally staggered back under the blow, Ella raced forward and *LEPTON* the back of the *MUSSEL*-bound *COLOSIUS*.

(Continued on page 26)

ECHOES OF THE PAST

With Bob Purtymun



Strombus raninus, Key West, 1944

Papa Strombus, Mama Strombus, with Little Baby Strombus bringing up the rear. I collected these *Strombus raninus* in 1944 along the weedy banks of the channel that was dredged eight to ten feet deep from the U.S. Naval Hospital in Key West, Florida to the open ocean. This was on the east side of the bridge that connected Boca Chica Island with Key West.

I don't know what changes have been made to Key West in the last 53 years, or even if the Naval Hospital is still there. I arrived as a Pharmacist Mate First Class after a three year cruise in the South Pacific on an attack transport in WW II. At the time I thought, "This is about as far as they can send me (a California boy) without getting me out of the United States."

Shortly after I arrived, my buddy Rob Roberts and I bought a sailboat, giving us the opportunity to fish, shell, and most important at the time, collect a few lobsters. You know Navy chow isn't the best in the world. Rob was in the commissary department and had access to but-

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(Continue from page 25)

"CONCH my man, will ya, ya big BULLIA! You don't MUSCULUS around and get away with it!" The diversion was just what Wally needed. A sweeping kick to BELA's left PATELLA sent him sprawling, his gun discharging as he hit the floor. Wally quickly disarmed him as Tony brought down HERCULEA with a judo chop to the TRACHEA.

As Wally cuffed him, BELA turned on the CHARISMA, "Wally! My buddy! Let's DISCUS the situation."

Wally eyed him coldly. "This is the end for EUBELA! You and your CONIAR gonna be put away — and nobody's gonna BAILYA out!" Wally turned, and saw Ella lying limp against the wall. He ran to her, turned her gently.

"Oh Ella, this is why I wanted you out of the BATILLARIA!" Her eyes opened as he examined the wound. The SLUG had grazed her forehead. "That's a nasty FISSURELLA, but you're gonna be fine!" She reached up, touched the egg-size HEMITOMA on his cheek, then turned her head toward the sulking SULTANA. "You don't have to worry about that CADELLA, ever again," Wally assured her. "You know, that was QUICKIA, Ella — you're the real HERO of the day. As the ambulance pulled away, he felt a friendly hand on his shoulder.

"She's ACUTICOSTA, a real CHAMA — don't let her get away."

Wally thought a moment. "You're right, GARI — I'm TELLINELLA how I really feel."

An ALABASTRINA VASUM of LILAX adorned the tiny table in the back booth at JULIA's. Ella, sporting a bandage above her left eye, sipped a PETRICOLA as Wally nervously swirled a well-deserved rum and coke. Ella ordered for them, as she always did — two fruit salads. Wally knew it was time for a change — in more ways than one.

ter, etc, and I was in charge of one ward which had an autoclave for sterilizing instruments. We could zap a lobster in about two minutes in that little baby, and with his special galley items, we'd have a feast.

That boat was not like the sleek fiberglass sailboats that ride the waves today. It was made of swamp cypress. There were many of these sturdy little boats around the Keys at that time. The Greek sponge fishermen used them until synthetic fiber drove them out of business. Then rum runners and cigar smugglers out of Cuba took over.

But back to shell collecting. My beautiful brilliant pink *Strombus gigas*, which I picked from hundreds of specimens, are a very pale pink now. I have two *Strombus costatus*, and a nice *Cypraea cervus*, a left-handed *Busycon perversum*, a 200mm *Fasciolaria tulipa*, and a nice pair of *Pleuroploca gigantea*. Plus a few odds and ends.

But, my favorite prize is a little yellow jewel box. It is only 25mm long and was a bright yellow when I collected it in 1945. Now it's a rather pale yellow. A *Chama* species? Perhaps *macrophylla*? That is all that I have left of my year on the island of Key West. I hope to get back to the Keys to check out the scene one of these days.



Open up that Autoclave! I'm on the right, holding the fish. Rob Roberts is center with a string of Florida lobsters, and I have no idea who the guy is on the left.

"I'm not eating MELANELLA," he protested. "A leg of LAMBIS what I want, with SCALLOPED potatoes — and a SNAIL salad, with OLIVA and TALOPENA." He eyed her warily, but she didn't respond. "And MORUM," he added, sliding his glass toward the waiter. He cleared his throat, unwrapped a PEPTA Bismol tablet, tossing the RAPA on the floor.

"Wally," she said quietly, "I wish you'd put your LITTORINA trash can." He gazed at her intently — did he really want to do this? He bent down and retrieved the scrap of paper.

"SAYELLA . . ."

"Yes, Wally?"

"Close one today, huh? Really made it by a close MARGINELLA." She nodded. He continued. "I want you to be HAPPIELLA. I want to TAKIA away from all this . . ."

"Wally, you'll never settle down . . ."

"I MYTELLA, with the right woman. I'd STILBE a lonely man if I hadn't found you." They gazed into each other's eyes — a real CODAKIA moment.

"It won't be all sunshine, Wally."

"Well, sunny ORANIA, I want to be with you, Ella...and Ella..."

"Yes Wally?"

"You got any MORICANDIA wanna share?" She smiled as she slipped him a tootsie roll. He smiled as he popped it into his mouth. They both knew that life from now on was going to be just HUNKYDORA.

If you got all the generic puns, score 50 points. Now...can you name the family assignment of each genus? We thank Paul, for his taxonomic tour de force, which originally appeared on Conch-L in July and September. Email Paul at Pmonfils@LIFESPAN.ORG.

CONCHATENATIONS:

New Western Atlantic Gastropods

by Gary Rosenberg

More than two years have passed since my last round up of new species of Western Atlantic gastropods, which covered 1993-1994. In 1995-1996, 52 species of gastropods were named from the Western Atlantic. I've listed 24 of these here, concentrating on neogastropods as most likely of interest to collectors. Most of the species that I have not listed are micromollusks or from deep water. To learn about these, seach my electronic database for "1995" or "1996" via Internet <gopher://erato.acnatsci.org:70/11/.wasp>.

Sinezona redferni Rolán, 1996 (Scissurellidae)

Iberus 14: 109-110, figs. 1-4. Size: 0.7 mm. Type locality: Chub Rocks, Abaco, Bahamas. Depth: 10-56 m. Comment: Also reported from Cuba.

Aclophora sagei Rolán & Fernández-Garcés, 1995 (Triphoridae)

Apex 10: 15, figs. 33-35. Size: 8.6 mm. Type locality: Cienfuegos Bay, Southern Cuba. Depth: 20-56 m.

Anulobalcis aurisflamma Simone & Martins, 1995 (Eulimidae)

Journal of Conchology 35: 224-233, figs. 1-25. Size: 11 mm. Type locality: Enseada Beach, Ubatuba City, São Paulo State, Brazil. Depth: 0-8 m (live).

Coronium elegans Simone, 1996 (Muricidae)

Bulletin of Marine Science 59: 49-51, figs. 7-9, 13-14. Size: 70.7 mm. Type locality: Brazil, São Paulo, off Peruibe, 24°30'S, 47°00'W. Depth: 110-130 m. Comment: Simone also transferred *Columbarium coronatum* Penna-Neme & Leme, 1978 to *Coronium*.

Coronium oblongum Simone, 1996 (Muricidae)

Bulletin of Marine Science 59: 47-49, figs. 1-2, 5-6, 10-12. Size: 50.7 mm. Type locality: Brazil, São Paulo, slope off Ubatuba, sta. 5362, 24°52'S, 44°34'W. Depth: 300-600 m (live 320 m).

Anachis carloslirai P. M. Costa, 1996 (Columbellidae)

La Conchiglia 27(280): 45-49, figs. 1, 3-4, 5 (left). Size: 13.7 mm. Type locality: Off Guarapari, Espírito Santo State, Brazil. Depth: 20-100 m (live 20-25 m).

Colubraria sunderlandi Petuch, 1995 (Buccinidae)

La Conchiglia 27(275): 39-40, figs. 7-9. Size: 27 mm. Type locality: Montego Bay, Jamaica. Depth: 20 m (live).

Metula fraussenii Bozzetti, 1995 (Buccinidae)

World Shells 15: 29-31, 2 figs. Size: 25.3 mm. Type locality: Off Eastern Nicaragua.

Thala crassa Lopes de Simone, 1995 (Costellariidae)

Bulletin of Marine Science 56: 805-811, figs. 1-11. Type locality: continental slope off Ubatuba, São Paulo, Brazil, 24°25'00"S, 44°16'05"W. Depth: 240-600 m (live 250-350 m). Size: 20.3 mm. Comments: Stated maximum length of 30 mm in text appears to be an error for 20 mm, based on lengths cited for type specimens.

Prunum enriquevidali Espinosa & Ortea, 1995 (Marginellidae)

Avicennia 3: 1-4, figs. 1-2, 3b-c. Size: 16.8 mm. Type locality: Cayo Coco, Archipiélago Sabana-Camagüey, Cuba. Depth: 1.5-2 m.

Prunum poulosi Lipe, 1996 (Marginellidae)

La Conchiglia 27(278): 11-12, 1 fig. Size: 30.1 mm. Type locality: Colombia, between Santa Marta and Cabo de la Vela, Peninsula de la Guajira. Depth: 55-73 m.

Terebra reticulata Lopes de Simone & Verissimo, 1995 (Terebridae)

Bulletin of Marine Science 57: 460-466, figs. 1-8. Size: 25 mm.

Type locality: OIUSP sta. 5361, slope off Ubatuba, São Paulo, Brazil, 24°42'0"S, 44°30'5"W, 320 m. Comments:

Preoccupied by *Terebra reticulata* J. de C. Sowerby, 1840.

Conus (Magelliconus) deynzerorum Petuch, 1995 (Conidae)

La Conchiglia 27(275): 36-37, figs. 1-2. Size: 13.5 mm. Type locality: Banco Chinchorro Atoll, Quintana Roo, Mexico. Depth: 3 m.

Conus julieandreae Cargile, 1995 (Conidae)

La Conchiglia 27(275): 24-29, fig. 1-4, 5b-c, 6, 7a. Size: 30.7 mm. Type locality: Cayos Caratasca, Honduras. Depth: 3-30 m (live 3-10 m)

Conus (Leptoconus) floridanus tranthami Petuch, 1995 (Conidae)

La Conchiglia 27(275): 37-38, figs. 3-4. Size: 21.5 mm. Type locality: Pickles Reef, off Plantation Key, northern Florida Keys. Depth: 2-10 m.

Conus (Leporiconus) ritae Petuch, 1995 (Conidae)

La Conchiglia 27(275): 38-39, figs. 5-6. Size: 27.5 mm. Type locality: Gorda Bank off Honduras. Depth: 10-20 m.

Clathurella eversoni Tippet, 1995 (Turridae)

Nautilus 109: 135, fig. 10-11. Size: 4.5 mm. Type locality: Off Dania Beach, Florida, between second and third reefs. Depth: 21 m. Comments: This appears to be *Nassarina glypta* Bush, 1885 (Columbellidae).

Drillia (Clathrodrillia) chaaci Espinosa & Rolán, 1995 (Turridae)

Avicennia 3: 30-32, figs. 1-6. Size: 19.6 mm. Type locality: Arrecife frontal de Puerto Morelos, Quintana Roo, México. Depth: 6-15 m (live).

Drillia (Clathrodrillia) dautzenbergi Tippet, 1995 (Turridae)

Nautilus 109: 129-130, fig. 4-5. Size: 27 mm. Type locality: Isla Margarita, Venezuela. Depth: not stated.

Drillia (Clathrodrillia) petuchi Tippet, 1995 (Turridae)

Nautilus 109: 130-132, fig. 18. Size: 53 mm. Type locality: Off Barbados. Depth: 142 m.

Drillia wolfei Tippet, 1995 (Turridae)

Nautilus 109: 127-129, fig. 1, 28, 31. Size: 19 mm. Type locality: 15 km east of Cape Lookout, North Carolina. Depth: 36 m (live).

Fenimorea kathyae Tippet, 1995 (Turridae)

Nautilus 109: 132-133, fig. 14, 32. Size: 36 mm. Type locality: West coast of Barbados. Depth: 58-152 m (live 152 m).

Fenimorea petiti Tippet, 1995 (Turridae)

Nautilus 109: 133-, fig. 17, 33. Size: 17.7 mm. Type locality: Gulf of Mexico, west of Crystal River, Florida. Depth: 59 m (live).

Melampus (Detracia) morrisoni Martins, 1996 (Ellobiidae)

Malacologia 37: 297-302, fig. 355-376. Comment: New name for *Detracia clarki* Morrison, 1951, non *Melampus clarki* White, 1895.



Left, holotype of *Coronium elegans*, 70.7 mm;
Right, holotype of *Coronium oblongum*, 50.7 mm

COA TROPHY WINNERS

Edited by Charlotte Lloyd



Dale Stream proudly displays his COA Trophy presented at the St. Petersburg Shell Show. His winning exhibit, "Fossil Pectinidae of the Atlantic," included taxonomy and photographs of the fossil shells in situ. Certainly well deserved, Dale. (above)



Seven cases of "The Genus *Cymatium*" won a very happy Bill Frank his 1st COA Award at the Jacksonville Shell Club Shell Show in the St. Augustine Armory on August 15-17. Bill's exhibit included photos of live animals and X-rays, and contained 65 of the recognized 74 species/sub-species in this genus. The show had 408 feet of scientific exhibits, so his competition was stiff. Congratulations, Bill. (right)



Georges Markens' exhibit of rare and significant *Cypraea*.



COA member Paul Kanner won his trophy at the Pacific Shell Club's Shell Show held April 19-20 of this year. His exhibit entitled "Pecten Shells" was entirely self collected while free diving and SCUBA diving. Unique approach and a good job, Paul! (above)

At the September 26-28, 1997 Central Florida Shell Show held in Orlando, Gene Everson won the coveted COA Award. Gene's 42 feet of "Cone Shells, World Wide" were arranged by geographical area and used splendid graphics and photography to show feeding habits, reproduction, shape, etc. This exhibit also brought home Shell of the Show and the Florida Caribbean Shell of the Show. (left)



Georges Markens was presented the COA Trophy at the Swiss International Shell Show in Lutry, Switzerland on June 14-15 of this year. He has collected and traded shells for some 45 years and his exhibit, "Shells of One Man's Show," included remarkable *Cypraea*. Some very rare giants, dwarfs and strange variations from his collection were shown.



CHARLES CARDIN

DEALER IN
WORLDWIDE

Specimen Shells

105 CHICKADEE CT.
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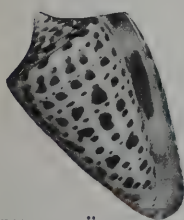
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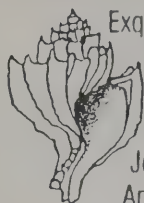
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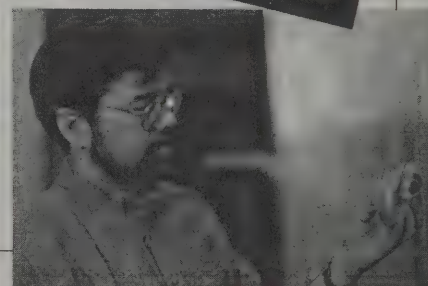
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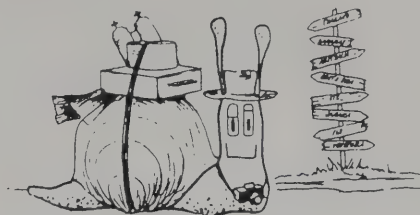
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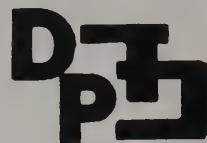
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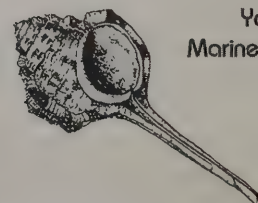
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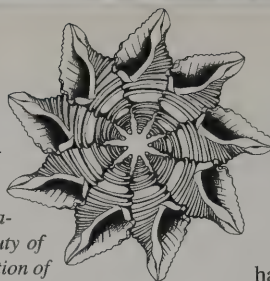
AMERICAN CONCHOLOGIST

QUARTERLY JOURNAL OF THE CONCHOLOGISTS OF AMERICA, INC.

VOL. 26, NO. 1

MARCH 1998

CONCHOLGISTS



OF AMERICA, INC.

VOL. 26 No. 1 MARCH 1998

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: *Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.*

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PRESIDENT'S MESSAGE

The Conchologists of America has come a long way in its development over the past 25 years. We are blessed to have a large membership of national and international members interested in the pursuit of conchology and malacology. COA is fortunate to have an excellent publication in the *American Conchologist* and to hold wonderful conventions every year in great locations. Our membership has always supported our efforts with their attendance and their membership, not to mention the money they spend at the convention each year. Thanks to your participation, COA has been able to give substantial grants each year to support individuals doing research in the field of conchology. I anticipate that this year will be no different. Our organization has much to be thankful for.

As President of COA, when it comes to running the organization I often wonder just what is on the minds of our members. I always ask myself if a decision is in the best interest of the membership. Will the decision benefit everyone? How will it be received? What does the membership really want from COA? Where are we missing the mark with our membership? What could we do better? Do you really like the way COA is run? Are you pleased with your officers and board? What would you like to see changed in the operation of COA? These are all questions, to mention just a few, that go through my mind when making decisions that will affect the membership and the organization. It can be a difficult task at times.

At the COA convention in St. Petersburg two years ago, we asked the members attending the convention to respond to a questionnaire that evaluated the annual COA conventions. This was followed by a questionnaire in the *American Conchologist*. Last year at Sanibel, I presented some of the data received in the questionnaire. The COA Board agreed to form an internal committee of Board members to develop a new questionnaire. The new questionnaire will evaluate the way COA business is conducted. At this time, that task is still in the "to-be-completed box." What questions would you like to see included in the next questionnaire?

I am very interested in how you, our membership, honestly feel the organization is operated. I hope you will take the time to respond to this request. I will welcome all responses and they will be shared with the Board. This is your opportunity to speak up and voice your opinions. Since we will elect a new President this year in Orlando, I would like to kick off this project now and provide the new President with data to help make a great organization even greater. You may contact me at 281-376-5630, or by email at dgreen@comwerx.net. I look forward to hearing from you.

Speaking of Orlando, I hope everyone is making plans to join us in July at the Hotel Royal Plaza in Walt Disney World Village. The Central Florida Shell Club is planning a superb convention. While attending this superb convention, you will have the opportunity to renew friendships, visit with fellow shell collectors, AND visit the No. 1 Attraction in the United States. I hope to see you in Orlando.

Dave Green

COVER: The cover depicts the 40mm land snail *Elaphroconcha bataviana* photographed in Ujung Kulon National Park in Western Java. *E. bataviana* is found on shrubs and low trees or foraging on forest litter. The two long, dark, body stripes extending back from the eyes are quite distinctive. Photo by Henry Martens.



COA 1998 – A Vacation Wonderland

Have you made plans to attend the 1998 COA Convention in Orlando, Florida? You don't want to miss this one! There is still time to mark the dates on your calendar, make your hotel reservation, schedule time off from work, tell all your friends that you will be gone, get a seat on an airplane, and get someone to feed the cat. Oops! Don't forget to pack the family! This one's for them too. You can enjoy the convention while your spouse and children enjoy the attractions that make Orlando famous!

The Central Florida Shell Club is preparing a memorable convention for your enjoyment. Central Florida may not be known for shell collecting, but we are known for Mickey Mouse! Thrill to the Magic! You'll definitely want to visit some of the Disney parks while you are here. They really are fun for kids of all ages. Epcot Center, Magic Kingdom, Disney-MGM Studios, and Disney water parks excite our imaginations. Nearby Universal Studios is also a fantastic theme park as well as a working movie studio, and is well worth a visit. And let's not forget Sea World.

Shell collectors are invariably nature lovers, so you'll be thrilled to know that there are some really fine parks and preserves. For instance, the Leu Gardens offer nearly fifty acres of peaceful grounds that let you enjoy "Old Florida" at a leisurely pace, including important rose, palm and camellia collections, *Hemerocallis*, orchids, bromeliads and native plants. Wekiva Springs State Park is a 6,400 acre state preserve on the edge of metropolitan Orlando. The Wekiva River is fed by Wekiva Springs, a constant temperature spring great for swimming. North of Wekiva Springs is Rock Springs, another popular swimming location which also feeds the Wekiva River. The area was once inhabited by the Timucuan Indians. A 13 mile trail winds through pine woods, palmetto woods, hardwood hammocks and jungles. You may hope to glimpse bear, deer, fox squirrels, otters, wading birds, raccoons and alligators. Canoeing is popular here too.

PLEASE CONTRIBUTE TO THE 1998 COA ACUTION

By the time you read this, the 1998 COA Convention at Walt Disney World will be just 4 short months away. Our capable and experienced auction chairpersons, Dave and Lucille Green, are already at work preparing for that auction, which they hope will be the biggest ever. But in order for the event to be a success, they need lots of help up front, help from all of us. Duplicate shells from your collections are especially desirable, but shell books, shell fabric, shell art and photography and other shell-related items are very welcome gifts to the auction.

Remember that it takes a successful auction to fund COA's very special Grants to Malacology Program. Since the inception of the Grants program in 1985, COA has awarded \$56,660.00 to malacological workers and students, funding projects and research on many aspects of the study of mollusks. So give generously to benefit the science of malacology.

Send your donations, questions and comments to:

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Museums in the area abound. Military history, Seminoles, railroads, Ripley's Believe-It-Or-Not, Florida history, the Holocaust, excellent science and art are offered up for your interest. And then there's the nearby town of Kissimmee, a little slice of Florida's past. Many of these museums are free. Come discover why Orlando is the Number 1 vacation destination in the world!

Our official convention hotel, The Hotel Royal Plaza, is the ideal location for enjoying all the convention has to offer as well as Walt Disney World and the rest of Orlando. Hotel guests enjoy complimentary scheduled bus transportation and guaranteed access to all three Disney Theme Parks: Magic Kingdom Park, Disney-MGM Studios, and Epcot. Don't forget that the hotel rooms can accommodate one to four people at \$99 per room (plus tax). There was a hotel registration form enclosed in the December *American Conchologist*, but we are tucking another one into this issue in case you need it.

But if you still need salt water, the Atlantic Ocean and Cape Canaveral are approximately 55 and 75 miles away respectively, and the Gulf of Mexico is about 95 miles distant. All this and the COA Convention too! With its fellow shell enthusiasts, the world-famous and eye-popping bourse, the COA Auctions and all the fine programs we have scheduled, this convention is guaranteed to fuel your love for our hobby and keep your attention riveted.

A little information for all of you attending your first COA Convention: you must register for the convention in order to attend any of the programs, and the Welcome Party, or to receive a registration packet, and you must wear your convention badge to attend these events. (The badge will be in your registration packet.) You do not need to be a member of COA to attend the convention, although you may join COA while you are there if you wish. The bid auction and bourse are free and open to the public. The field trip and the banquet are optional and require an additional charge. Guests may attend the Welcome Party if you purchase a ticket for them by a to-be-specified deadline. We are offering a special registration fee for children under 12 years of age. This will entitle them to attend the programs and Welcome Party, but no registration packet. **Be sure to look for your registration form mailed with this issue of American Conchologist!**

One last note: the correct group number for the Royal Plaza Hotel is 2036.

PATRONS WANTED

Do you love the COA Convention? Look forward to it every year? Here's your chance to support it in a very special way: for a donation of \$50 or more you can be a "Patron of the Convention."

The annual convention is our only moneymaking event of the year. You may be surprised to know that your membership dues do not cover even the cost of printing and mailing *American Conchologist*. Putting on a convention is very expensive, especially when it comes to those events that include food service. Often our profits are eaten up by our costs.

So, if you would like to help defray some of the costs, and make the convention more of a financial success for your favorite organization, your contribution will be appreciated. If you cannot personally attend this year's convention, you can still be a part of it. Remember, the bulk of the proceeds of the convention go to support our Educational Grants program, a program we are very proud of.

All donations received by June 1 will be acknowledged in the Convention Program booklet. Any "Patron of the Convention" who can't attend the convention will receive his copy by mail after the convention. Donations can be sent to Bill Burrage, Convention Treasurer, 2722 Amsden Road, Winter Park, FL 32792, or they can be included with your registration fees.

We thank you for your support.

THE SUNDA STRAIT, BALI, AND LANDSNAILS

By "Henry A. Martens"

The names "Java," "Sumatra," and "Bali" create magical, exotic images. I certainly looked forward to my trip, with a group of twelve to Bali and western Indonesia, last year.

In the Sunda Strait between Java and Sumatra, fifty miles due south of the infamous volcano, Krakatau, is Ujung Kulon National Park, the first area our little group visited. The park occupies the entire Ujung Kulon Peninsula of western Java as well as the islands of Peucang, Panaitan, and Handeuleum.

One of the greatest volcanic eruptions of historic time, the 1883 Krakatau event, caused explosions which were heard 2,900 miles across the Indian Ocean on Rodrigues Island off the east coast of Africa, and at Alice Springs 2,250 miles to the southeast in central Australia. The ash fell on Singapore 520 miles to the north, Cocos Island 720 miles to the southwest, and on ships 3,800 miles to the west-northwest. The consequent tidal wave (tsunami) reached heights 130 feet above sea level and hurled ashore pieces of coral weighing up to 600 tons. At least 37,000 people perished, mostly from the tsunami, and many coastal villages were destroyed. Compared to the Mount. St. Helens eruption of 1980, Krakatau ejected 25 times more material.

Although only a third of Krakatau remained after the eruption, it did not kill off the animal life of what is now Ujung Kulon National Park. The tsunami devastated the coastal areas but did not penetrate the interior. Although people were killed on Panaitan Island, the inhabitants were not evacuated until early in the 1900's when there was "a plague of tigers."



The multi-color *Amphidromus banksi* has shell pattern variations; Java — Peucang Island

The following species were reported from Krakatau before the 1883 eruption but have not returned: *Cyclophorus perdix*, *Hemiplecta bataviana*, *Hemiplecta javacensis*, *Chloritis helicinoides*, and *Amphidromus inversus*. All of these except *Amphidromus inversus* occur on Panaitan and Peucang Islands.

We stayed at the Ujung Kulon Park lodge located on the east side of Peucang Island, a couple of miles off the west Java coast. On the grounds are a small herd of barking deer and many gray macaques. We often saw the four foot long Java monitor walking along the beach and venturing into the sea. We visited the "mainland" at three locations and made two visits to the large island of Panaitan.

A monograph of the land snails of Panaitan was published in 1955 by Butot. This reference, along with the Java studies of Von Benthem Jutting, was a great help in the identification of the species we saw. The regions are largely an open primary rainforest with little undergrowth. Forest access is easy and horizontal visibility is good. The annual temperature ranges from 77° to 86°F (25° - 30°C) with humid-



Amphidromus perversus is the common Bali species; Bali — Antossari

ity between 80 and 90%. Butot was there for the month of September of 1951, the driest month (April to October has 150 millimeters of rain per month). I was there in the wettest season (November to March with 400mm per month). In places where Butot reported seeing two to four living specimens, I saw over ten or twenty.

The most showy of the landsnails is the large, colorful *Amphidromus banksi*. They greeted us from the pandanus leaves and the tree trunks at the boat dock. We saw *A. banksi* both on the islands and on West Java. Originally considered to be *Amphidromus perversus*, this wasn't recognized as distinct until Butot named it in 1955. His choice of species name is very appropriate because Joseph Banks accompanied Captain James Cook on his first voyage to the South Pacific in 1769. Banks was the first European to collect shells on Panaitan Island (then called Princes Island) from January 7 to 14 of 1771.

The shell of *A. banksi* is quite variable. Butot stated it was "plain yellow, plain creamy white, or spirally banded with a few broad or many narrow bands of brown, or greenish tint." The shells are always sinistral and perforate. "The aperture is always dark violet within, except in the yellow or whitish shells."

During my six-night stay in the park, I came up with a few observations and questions on *Amphidromus* and specifically on *A. banksi*:

1) *Amphidromus* likes sunshine. I have only seen live specimens in sunny areas in Bali, Sabah, and West Java. In the forest without a shrubbery understory it lives in the forest canopy. When shrubs are present and in the sunlight, it will live on them.

2) There is great color variation. Of the adult specimens seen, 92% were multi-colored, 5% were yellow-green, and 3% were white. The juveniles were 97% multi-colored, 2% yellow-green, and 1% white. The percentages are skewed by the large number of multi-colored shells seen on Panaitan Island.

3) There is a pattern to the color distribution. Based on my limited observations, the single-colored forms become more dominant as one moves eastward from Panaitan. None was seen on Panaitan, 18% were yellow-green on Peucang, with no white forms; and 17% were yellow-green and 83% white on Ujung Kulon Peninsula, with no multi-colored forms. I realize this is only based on a few specimens, but it was observed.

4) Are the solid-colored forms really *A. banksi*? No other *Amphidromus* species has such variation. The uni-color form is as different from the multi-color form as it is from any other *Amphidromus*. I would be tempted to separate them, and I am a "lumper."

5) About 43% of the dead shells seen were juveniles. Isn't this a high percentage? It seems like a high energy loss before reproduction can even begin.

6) How far does *Amphidromus banksi* travel? Does it leave its arboreal life and come to the ground? The juvenile snails living on pandanus leaves did not venture very far. We saw them on Peucang Island at the same place in the early morning, at noon, and in the evening. On Panaitan Island at Legon Butun by the boat pier at 8:00 a.m. (1-21-97), adults were low on the trees and also on a wooden bench. At 1 p.m. that day no snails could be seen, even on the bench. The former bench specimens had to walk on the ground to leave the bench. They had not been collected!

7) *Amphidromus* rests on a tree with the spire of its shell up!

8) How does it know which tree to ascend? How does it know if the tree is only a foot tall? How does it know if it is dead at the top? How does it know if the tree bends and does not reach the canopy?

9) Does *Amphidromus* have the ability to home? Quite a few snails do.

The many empty shells on the forest floor represent a typical death assemblage. The older shells have lost their color and others have broken apart. The breaking is typically at the suture line before the body whorl. Consequently, there are many detached spires and body whorls. The empty shells found on the ground are a two-dimensional representation of a four dimensional event. The shells are together in death, but they may have been living in different habitats and at different times. The arboreal, terrestrial and soil dwellers are all mixed together regardless of original habitat and time sequence. The death assemblage doesn't tell us anything about the shells that have decomposed and are no longer in the assemblage.

Another showy snail seen alive on leaves was the 14mm bright green operculate, *Leptopoma perlucidum*. The animal is green but the shell is a transparent white. Consequently, the empty shells are colorless. *Leptopoma altum* is usually smaller, and has one or more colored spiral bands or has spiral ribs.

The large, 40mm wide *Elaphroconcha bataviana* (pictured on cover), with its dark brown umbilicus, is easily identified. The color patterns vary from a wide brown band below the periphery to a single narrow peripheral stripe. The two dark body stripes extending back from the tentacles are quite distinctive. The snails were on low trees and shrubs and also foraging on the forest litter. The 35mm wide shell of *Elaphroconcha javacensis* is similar to *E. bataviana* with the dark umbilicus but has multiple spiral stripes.

Hemiplecta humphreysiana with a diameter of 55mm was also present but we saw few live individuals. The animal lacks the two body stripes and the shell lacks the dark umbilical area. The 12mm diameter *Chloritis helicinoides* with its reflexed lip and keeled periphery was



The only form of *Cyclophorus perdis perdis* on Peucang Island is *C. p.p. forma zollingeri*; Java — Peucang Island

also present on the forest floor at most localities. On the tree bark, especially in crevices, was the lens-shaped *Trochomorpha planorbis*. The brownish translucent shell, 5-6mm high and 15-17mm wide, is very fragile and was only found on Panaitan Island.

The large operculate *Cyclophorus perdis perdis* forma *zollingeri* was found on the mainland along the forest trail at Cibom.

On Panaitan Island north of the pier were some mangrove trees, about 50 yards offshore, but the ebb tide allowed dry access to the trees. The leaves and stems had many *Littorina*, including some very pretty ones.

The island landsnail fauna is lacking in carnivores. The evolutionary sequence in island zoogeography is scavengers, herbivores, and finally carnivores. It appears our islands are in the first and second stages but have not reached the third.



Leptopoma altum is distinguished by spiral banding; Java — Panaitan Island

We left Ujung Kulon by retaking a seven hour boat ride to Carita. Here I found some freshwater species in a culvert. These included *Viviparus javanicus*, *Melanoides tuberculata truncatula*, *Lymnaea rubiginosa*, and *Gyraulus convexusculus*. I also saw many live *Achatina fulica*, an introduction, originally African. Along the beach were "live" *Pila* shells that had been carried downstream by flooding.

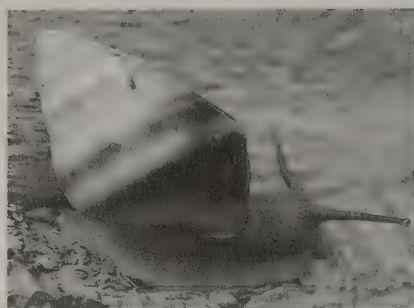
On Bali we stayed at the Puri Santrian Beach Resort in the city of Sanur on Badung Strait. On the hotel grounds I saw *Achatina fulica*, *Asperitas raregutata* forma *crebiguttata*, and *Amphidromus perversus*. *Amphidromus perversus* is both dextral and sinistral and has great color pattern variation. There were some of the same freshwater species in the garden ponds.

On a visit north to the Botanical Garden we saw many small snails in the soil under the trees. I saw *Parmarion martensi* crawling on a tree trunk. It looked like a slug except it had a fingernail-sized flat shell over the visceral hump. They have been reported eating the latex on the rubber trees.

At Nusa Dua Beach area on Bali's southern peninsula I spotted many live *Achatina fulica*. The Tanaklot Temple to the northeast along the coast has a very spectacular setting. It is a real Bali version of France's Mont St. Michel. The coast is rugged, and the temple is on an island a few hundred yards offshore. I was there at low tide when the island could be reached by land.

North of Antosari village in south-central Bali I found *Pila ampullacea*, *Thiara scabra*, and *Melanoides clavus* in a rice terrace. Also saw many *Amphidromus perversus* and *Achatina fulica* near a farmhouse.

After leaving Bali, our next stop was the island of Gili Meno, off the west coast of Lom-bok. Gili Meno is the smallest of the three Gilis. "Gili," by the way, means "island." It is about a mile long, half a mile wide, and has a maximum elevation of three feet. The trees are casua-



This multi-color *Amphidromus banksi* has a dark body; Java — Peucang Island

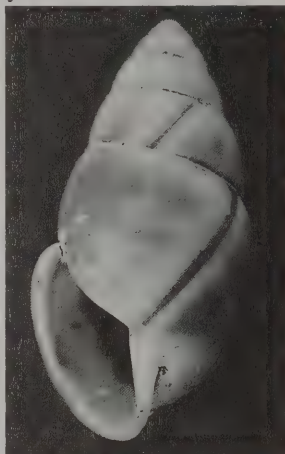
shore. Our guide said that the lake dries up during the dry season.

We took a morning visit to the largest and most western of the Gilis, Gili Trawangan. It is also the farthest from Lombok. At 7 a.m. under cloudy sky we boarded our outrigger for the 15 minute ride. I was dropped off "downtown," and the rest of the group went snorkeling.

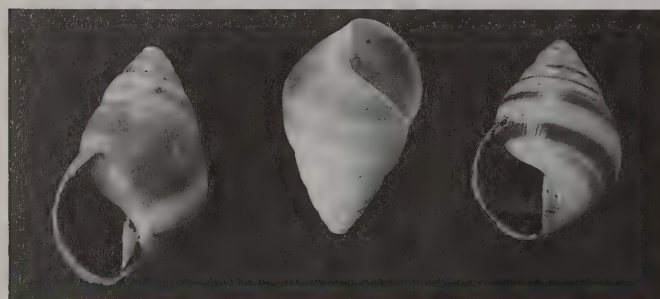
This island has a hill on the south end above the village. It was mostly planted with tapioca and corn, with some wild vegetation and trees. I walked to the top of the hill and only saw a few Subulinidae. I checked the trees and the ground but found no snails. I had expected to find *Amphidromus*, but maybe the habitat is too disturbed. From the summit I could look across at Gili Meno and see the salt water lake I visited yesterday. It started to rain so I headed for the shelter of the trees. When it subsided, I went back to the village. While I was waiting for lunch in the village, a rain of torrential proportions began. The "street" became a lake. Fortunately, it stopped before we returned to Gili Meno in our open outrigger. On our arrival at the lodge, we found the lodge surrounded by water. My cottage was only water-free on the raised pathway. A landsnail observation: low islands that are flooded by monsoon rains have few land dwelling species.

On our last day in the Gilis we visited the Lombok mainland village of Tanjung, located almost due east. The village of 200 people is located between two rivers, the larger of which is Kali Segara. These people are fishermen and farmers. They also eat the marine and freshwater snails. The terrain is very similar to the Gilis, low and flat. I saw no terrestrial snails, but I was shown some freshwater species they eat. These included the pelecypods *Anodonta woodiana* and *Pilsbryconcha exilis* and the gastropods *Pila ampullacea*, *Melanoides clavus*, *Melanoides tuberculata truncatula*, *Cerithium*

rina and coconut palm. The only snails we saw were very small ones in the leaves under shrubs. The most interesting was a small truncatellid, *Taheitia* sp. with its round, untoothed aperture and ribbed whorls. It lives in the ground along the edge of swamps. There is a brackish water lake on the island. I didn't find anything in the mangroves along the lake



The black vertical lines may indicate the end of the growth season in multi-color *Amphidromus banksi*; Java — Panaitan Island

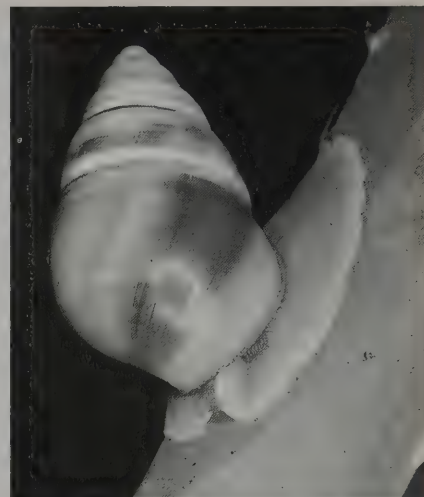


Shell pattern variation in multicolor *Amphidromus banksi*; Java — Panaitan Island

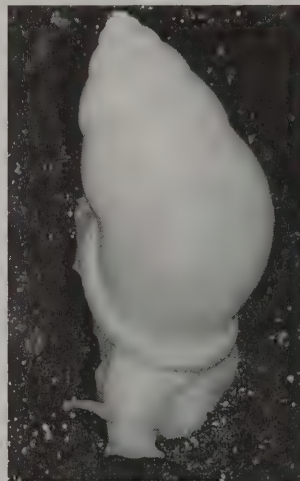
nodulosum, and the planorbid *Indoplanorbis exustus*.

On our return to the Lombok airport near Mataram for our flight to Medan, Sumatra, I looked near the beach at Pemenang but didn't see any snails. The highway climbed the mountains and there were monkeys all along the roadside. It is consequently called the Monkey Forest. At a rest stop at Pusuk Pass there was a fragment of *Asperitas*. This is a very lush rainforest area and I am sure there were plenty of snails lurking in the woods.

We left Medan early for our ride to Lake



Amphidromus banksi, multi-color, at night with a light colored animal; *Amphidromus* rests on a tree with the spire of its shell up! Java — Peucang island



The solid white form of *Amphidromus banksi* on a tree; Java — Peucang Island

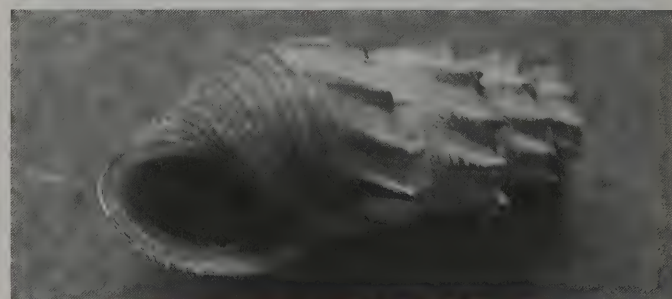
Toba. Along the way we stopped at cacao and rubber plantations. Incisions are made in the rubber trees daily between 6 and 8 a.m. and the latex-filled cups are collected at noon each day.

Lake Toba occupies one of the largest volcanic depressions in the world. It is 60 miles long, 18 miles wide, and 2,000 feet deep. Geologists estimate it ejected 500 cubic miles of material. This is over 110 times that of the great eruption of Krakatau. In Lake Toba is Samosir Island. It is huge; I didn't realize it was an island at first, thinking it the other side of the lake. On the hill behind the Hotel Silintong I saw *Everettia* and *Achatina fulica*.

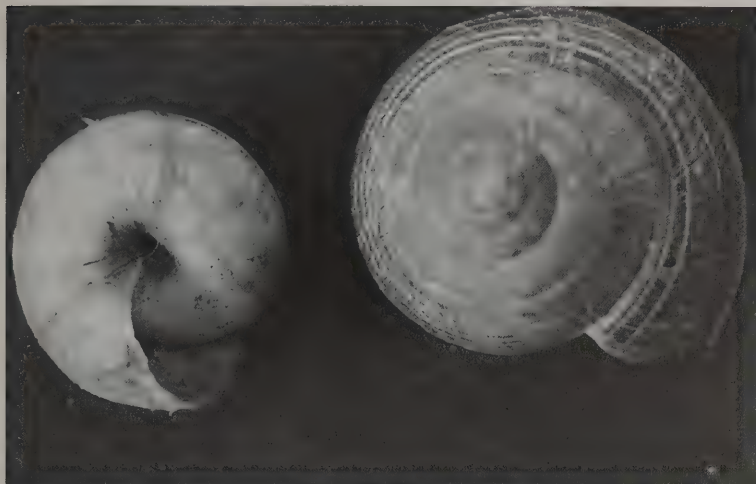
I saw very little native vegetation in West Sumatra. The entire region around the lake, including the island, had been logged. The two-needled Java Pine, *Pinus mercuri*, has been extensively

planted. It has changed the habitat with its acid litter. The lake region is much drier than the other areas we have visited. It would make a useful documentary to film the Lake Toba region as an example of the devastation and poor recovery of a logged area.

This ended my Indonesian adventure, the highlight of which was definitely West Java. I wish we had had time to visit Krakatau. Maybe next time.



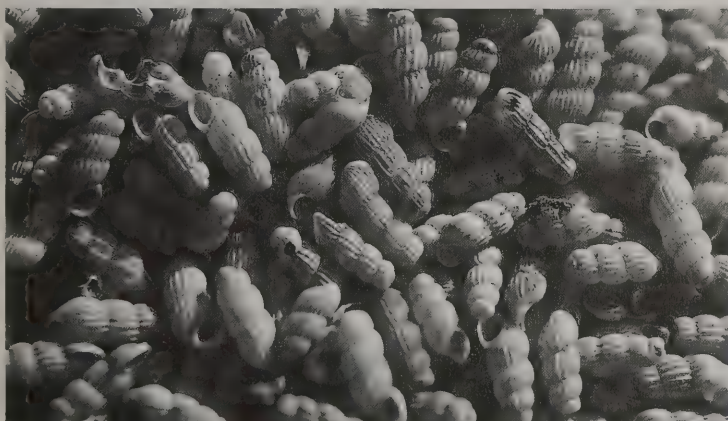
The spire of *Thiara scabra* descends in steps, pagoda-like; Java — Ungung Kulon Peninsula



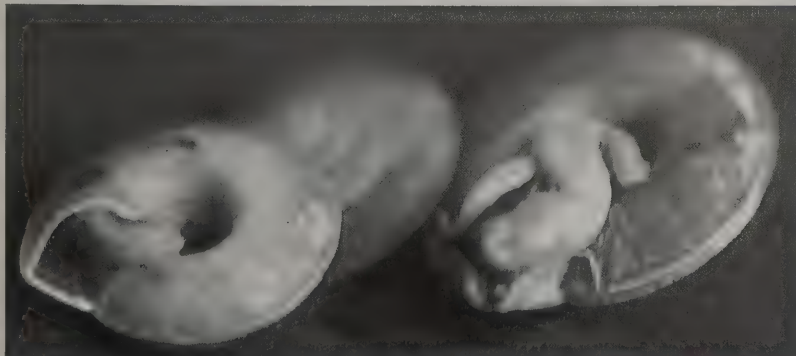
The spiral bands on the shell are evident in *Elaphroconcha javacensis*; Java — Ungung Kulon Peninsula



Parmarion martensi is a shelled slug; its shell is covered by the fleshy mantle here; Bali — Botanical Garden



Some *Taheitia* shells picked from a soil sample; Lombok — Gili Meno



The lens shaped *Trochomorpha planorbis* is arboreal; Java — Panaitan Island



The shell of *Melanoides riqueti* has a conical shape; Java — Ungung Kulon Peninsula



Viviparus javanicus is a freshwater operculate; Java — Carita



The operculum is visible on the foot of *Leptopoma perlucidum* crawling on the underside of a log; this animal is green and the color is seen through a colorless, translucent shell; Java — Panaitan Island

ECHOES OF THE PAST

With Bob Purtymun

From my dive log 23 May 1988 Anchorage at 11° 06.45'N X 119° 24.4'E

I want to tell you about an almost no dive. We, Wes Thorsson and I, were on Gwen Cornfield and Mike Campbell's yacht Loreley. At 1555 hours we anchored off the western side of Malapacao Island on the northern end of Palawan in the Philippines. It was a calm little bay with very little wave action. Just the place for a great night dive.

After dinner, about 2000 hours, we suited up and set our compass bearings on a cliff (a huge volcanic plug) about 100 meters to the east. I hit the water first and went down the anchor chain with Wes and Mike following. At 60' of water and about 20' from the bottom, I dropped off the anchor chain and drifted on down to the bottom. Visibility was now down to about 4'. I didn't realize that I was on the bottom until my hand hit something hard. My hand and part of my forearm had disappeared in about 12" of a dark reddish slimy mud. My first thought was to abort this dive, but my buddies grouped up and motioned to go on our compass route.

This turned out to be a good idea, as I hadn't gone far before I collected a huge *Vexillum lyratum* (Lamarck, 1811) 55mm long. The bottom was sloping up and the visibility was getting a little better, about 15'. It was then that I collected two *Vexillum vulpecula* (Linné, 1758). The second one, a slender shell 53mm x 22mm, was in the trail behind the fatter first one (52mm x 24mm). I think that the little guy probably had an ulterior motive on his mind.

The first time this happened to me was in the early 1970's when I was on snorkel in about 20' of water off the Hilton Hawaiian Village Hotel sand channel off Waikiki, bounce diving*. I found a sand trail and was following it when I collected a large *Terebra guttata* (Röding, 1798) going down the middle of a trail. I had made two or three more dives when all of a sudden the light went on. That *Terebra* had more on his mind than food. I finned back and picked up the trail again to go in the direction that *Terebra* had been headed. Sure enough there was a large fat *T. guttata* at the other end of the trail.

But back to the Philippines. At the base of the cliff the bottom sloped up to the surface, and I added three more shells to my collection on the way up: a *Tapes litteratus* (Linné, 1758) a *Bufonaria subgranosa* (Sowerby, 1836) and another bivalve species.

*Bounce diving: dropping to the bottom and finning along for a minute or so, then popping back to the surface for air. This is the way that we spear fished for ling cod in the frigid waters of northern California in the 1950s and '60s.

1200 Brickyard Way #407, Point Richmond, CA 94801
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23 May 1988: This volcanic plug is the object of our compass bearings.

Enough of this mud diving! I finned my way back to the boat on the surface.

Editor's note on the December 1997 "Echoes of the Past" (p. 26): the photo caption for the three men in a boat is incorrect. Bob now tells us it should read, "Open up that Autoclave! I'm on the left holding the lobster, Rob Roberts is center with a string of Florida lobsters, and I have no idea who the guy is on the right."



Left: The fat and slender *Vexillum vulpecula* pair
Right: *Vexillum lyratum* from my mud dive.

Letters:

Dear Mr. Purtymun:

I am very much delighted by your article "The many faces of *Vexillum* (*Costellaria*) *sanguisugum* (Linnaeus, 1758)..." [AmConch, June 1997]...especially valuable are your observations on the habitat of the illustrated color variants. I hope that you continue this object, for there are — as you will know — many other faces of this wonderful species. I myself have published, for instance, the forms *transposita*, *castaneosticta*, *condoriana* and *granosa*, mainly by means of their type specimens, and in my collection are many specimens showing intergrades between all these named forms.

Only one point...the spelling "*V. (C.) sanguisugum*." Linnaeus has given the name *Voluta sanguisuga*, where the species name *sanguisuga* means the well-known leech (bloodsucker worm). In other words: *sanguisuga* is a substantive in opposition to the genus-name and therefore may not be changed in combination with generic names of any grammatical gender. This rule is laid down in the *International Rules of Zoological Nomenclature*. I know, however, that several authors have neglected this rule when writing "*Vexillum sanguisugum*." This error of thoughtlessness was initiated by Walter O. Cernohorsky (1970 and earlier and later works by the same author) and was copied even by authorities like Tucker Abbott (*Compendium of Seashells*). Nevertheless the unequivocally correct spelling is *Vexillum* (*Costellaria*) *sanguisuga*.

Yours sincerely,

Hans Turner

Casa La Conchiglia, CH-6821 Rovio, Switzerland

Disaster Area: El Niño is here!

By Jose Coltro Jr.

Today everybody knows about the phenomenon, El Niño, the warm current that appears in the central Pacific and makes the weather crazy all around the world. Of course, this situation also occurs here in Brazil. In January 1997 I bought a new large boat to start to dredge and to make long trips to collect shells. The boat took 4 months to be outfitted to dredge, and my people made their first attempts to dredge in June. The first trips were close to Guarapari, Espirito Santo and went off without problems, but also without good results! I decided to send the boat to south Bahia State, an area extremely rich in shells.

The boat took about one week to arrive because the weather was terrible. I had some hope that the weather could change, but during the entire month of July the boat spent all its time docked. The situation was the same during August. Well, I thought, September begins our springtime and the weather on all Brazilian coasts is normally wonderful. I was completely wrong. We had one of the worst storms on our coast, full of strong winds and terrible seas. I almost lost the boat!

The boat stayed in south Bahia all October and finally started to dredge. The bottom wasn't good and few shells appeared — most of them dead! My diver A. Bodart did a deep dive to take a short look at the bottom and he found a completely destroyed area. The coral reefs were seriously damaged; strong dark brown algae was covering most of the bottom. For days, he dove around and he didn't find shells, or fish or lobsters, only destruction. Because the area where he was diving is little explored, there is no way that the destruction is the fault of man. It is the fault of El Niño!

At the end of November Bodart brought the boat back to start the summer diving in Guarapari. Again, he had a rude surprise. The seawater was so cold that he developed sinus problems — something that he had never experienced in his 15 years diving there. Another shock was that the entire bottom had that same brown algae covering the coral reefs and bryozoan bottom. Again, he could find no shells, fish or lobsters. Even 40 or 50 kilometers from the coast the situation was the same. This development has put many fishermen in a really bad situation because they can't fish close to the coast. They are having to fish far from port and the weather is always a big problem.

We stayed in São Sebastião, on the São Paulo coast, during the last

week of December and the first days of January. My brother Marcus, my friends Luiz Francisco Viscardi, Ricardo Guerrini and Eduardo Schirmeister and I went to dive and we had a big surprise. The water was so warm that we didn't need our wetsuits. Normally this time of the year the water is about 20°-22° Celsius (72°-76° Fahrenheit) and very clear, but it was very warm (26°-28° Celsius) and green. The bottom was full of green algae and we saw large fishes — not at all normal here. We have only two species of corals in this area and most of them were dead! And, again, we didn't find shells, except for a huge population of *Cypraea zebra* (a tropical species, this far south!). But, even the *C. zebra* was different — almost 100% of the specimens had distinct bubbles in the dorsum. Some specimens had green algae under the shiny surface, too.

The normal weather during spring and summer is really pleasant in south central Brasil. It is warm, but not too hot, fresh, windy and not so wet as Florida. But since El Niño arrived we don't know what might happen. During the second week of January the temperature dropped to 10°-16° Celsius (52°-64° Fahrenheit) for 4 days! This is our summertime!

I believe that El Niño will very soon change most of the fauna in the malacological provinces. Tropical species will appear more often in non-tropical areas like São Paulo and on the west coast of America. My friend, Dr. Gustavo Noboa, from Guayaquil, Ecuador, told me that some really strong rains in the Ecuadorian coast changed all the local flora and fauna quite a lot. The coast is normally arid with cactus and very few green plants and the rivers are dry for years. But since this last El Niño, the coast is green like a tropical area, the rivers aren't dry anymore and the sea is warm and dirty with river waters. Many shells are appearing dead on the beach, and not only shells, but also all kinds of sea life, including some Galapagos birds!

I remember when I was in Playa Ocotal, Costa Rica, in 1993 and most of the coral reef was dead. I asked a local diver about it and he told me that the water was so hot that most of the sea life was dead or had disappeared. I found some tropical Pacific shells, like *Conus ebraeus*, *Cypraea moneta* and *Mitra mitra* there! Probably in a few years many local species around the world will be extinct or they will be colonizing new areas, changing all the malacological provinces. It is El Niño's fault.

Psst! Rumor has it that there'll be more Coltros than just our old friends Jose and Marcus at the Orlando Convention. We hope to meet those VERY significant others, and another family member or two.

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MUSEO DEL MAR, URUGUAY

by Bruce Crystal

About five years ago, the COA Convention had a visitor from Uruguay, Pablo Etchegaray. Ben and Josie Wiener introduced Pablo to some of the members and made him feel welcome. (I had been one of those to whom Pablo was introduced at COA.)

Last November, Roxy and I visited Uruguay on a three week Elder Hostel trip. I had written Pablo, hoping to set up a time when we could get together. Fortunately our group stopped for lunch in Punta del Este, near where Pablo is located, and I was able to leave the group for a few hours' visit.

Pablo drove me to the site where the construction on his Museo del Mar was close to completion. The museum already had many shell exhibits in one room with display cases all around the walls and back-

to-back cabinets forming an island in the middle of the room. In a second room, there was laid out the skeleton of a right whale.

Pablo has written that in the time since I was there, the exhibit area is now increased four times. Added to the existing exhibits are aquaria with fish and seahorses. There are also fine exhibits of echinoderms, coelenterates, stuffed seabirds, marine mammals, crustaceans and turtles.

The molluscan exhibits include more than 5,000 specimens of bivalves and gastropods from around the world, separated by geographical location and then by genera. Informative data include names, locations and some explanation regarding habitats, diet, reproduction and shell cell structure. Additionally there are photos depicting habitat and live mollusks.

I enjoyed the museum's exhibitions very much in their abbreviated version, and on our next visit will be most interested to see the expanded version. This is an attraction not to be missed by shellers who visit Uruguay.

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BOOK REVIEW:

Felix Lorenz, Jr. and Alex Hubert. 1993.

A Guide to Worldwide Cowries.

Verlag Christa Hemmen, Grillparzerstr. 22 D-65187 Wiesbaden, Germany. 571 pp., 53 figs. + numerous unnumbered figs., 124 pls. DM 168 + shipping and handling. Priced by Mal de Mer Enterprises, PO Box 482, West Hempstead, New York, NY, 11552 at \$129.00.

REVIEWER'S NOTE: Four years ago I wrote a review of Lorenz & Hubert for *The Festivus* (Groves, 1994). After four years of frequent use I am still as impressed with the volume as I was in 1994. More recently I inquired to editor Lynn Scheu via e-mail as to why the book had not received the same treatment from *American Conchologist*. Her reply was, in part, "Would you like to? It's never too late." That review follows.

Prior to the publication of this massive "guide" to the living cowries of the world, authors Felix Lorenz, Jr. and Alex Hubert were relatively unknown to most American collectors. However, Lorenz and Hubert have successfully accomplished much more than the intended "guide to taxa and an aid for collectors and scientists to identify species by their shells," although in some instances they refer to animal characters (e.g. the *Blasicrura teres* group). Before Lorenz and Hubert, cypraeologists relied on the indispensable references of Allan (1956), Burgess (1970 & 1985), Taylor & Walls (1975), Walls (1979), and Liltved (1989). Undoubtedly, *A Guide to Worldwide Cowries* has superseded these classic volumes.

A major portion of the text is organized as a "checklist" that treats four subfamilies, 35 genera, 207 species, 80 subspecies, and 80 forms recognized by the authors, based mainly on shell comparison. The taxonomic arrangement is similar to that of Schilder & Schilder (1971) in which related phylogenetic groups are arranged systematically. The authors "deviate in some detail from Schilder's assignment," particularly at the subspecific level. Because no updated identification guide exists that compares anatomical, radular, and phylogenetic relationships of the entire family, shell features remain the focus of cypraeid classification for the present, especially for extinct genera. The authors briefly define each of the four subfamilies, and the 35 genera, and they compare similar species, subspecies, and forms within each section. They consider the subdivision of species into varieties and/or forms "a service to collectors" that has minor taxonomic significance. Complex taxa such as the South African *Cypraeovula* species group and the Indo-Pacific groups of *Erronea onyx*, *Cribrarula*, and *Blasicrura teres* are well treated.

Within the "checklist," each species entry includes the original reference, synonyms, diagnostic characters, important forms and/or varieties, size range, habitat, discussion, and range maps. Perhaps the only improvement to this marvelous volume would be to arrange the plates within, rather than following, the text. Dispersed throughout the text, line drawings by the senior author of selected Recent and fossil species supplement the plates. An extremely useful illustrated key, a multilingual glossary, and a synonymy of living species follow the text. The Appendix includes the description of a new subspecies of *Cypraeovula coronata* Schilder, 1930, from South Africa. Notes on recent finds and developments include the now notorious *Chimaeria incomparabilis* Briano, 1993, from deep water off Somalia. Innovations of "the guide" are the inclusion of "a hypothetical family tree of cowries," which clearly illustrates their long fossil history, and 12 hand drawn plates by the senior author that are dedicated to selected fossil species.

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With the exception of Allan (1956), the single genus *Cypraea* has been utilized for the entire family Cypraeidae by most recent authors. Burgess (1970 & 1985) recognized that numerous species groups exist that are characterized by shell features, anatomy, and geography but chose to retain the single genus system and to use these species groups as subgenera based on the earlier works of Kay (1957, 1960, & 1963). Lorenz & Hubert used the Schilderian system of multiple genera for their classification scheme based on "detailed, multi-level systems" that "have the advantage to show better the intrinsic relations." The Schilderian cypraeid systematic scheme is based largely on shell features and radular analysis; Lorenz & Hubert have also incorporated mantle characters into their multiple genus classification. Notably, they simplified their system somewhat by eliminating the "clumsy level of subgenera altogether." They contend that the genus "lumpers" may convert their genera into subgenera and retain the single genus *Cypraea* at their own discretion. The recently published *An Atlas of Cowrie Radulae* by Bradner & Kay (1996) also utilizes the multiple genus system for the family based upon similar radular pattern groups [see Burch (1997), Meyer & Guralnik (1997), and Bradner & Kay (1997) for reviews and commentary]. Ultimately a total cladistic and/or molecular approach to this debate will be necessary to further refine the multiple-genus system. Christopher P. Meyer (University of California, Berkeley, Integrative Biology & Museum of Paleontology) is currently preparing a Ph.D. dissertation that utilizes cladistic and molecular techniques applied to cypraeid systematics and phylogeny [see Meyer (1997)].

Although it has been over four years since the publication of *A Guide to Worldwide Cowries*, Messers Lorenz and Hubert are indeed still to be congratulated for this massive effort that is a "must have" in the library of cypraeologists, both professional and amateur alike. Those who cringe at the \$129 price tag, take note of the 112 color plates of shells and living animals which make this volume well worth the price. — *Lindsey Groves*

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LISTENING IN ON CONCH-L:

Conch-L, COA's internet listserver, is always a fertile and stimulating place to be for conchologists. Here for you to enjoy are some of the discussions that have reached Conch-L subscribers through cyberspace.

On Pectens in Conch-Land

Bret Raines, well-known pecten collector, wondered about his strange new *Mirapecten*:

I received some pectens today from the Philippines, which normally happens about every other month. However, today was different. I opened one of the grab bags, and to my surprise, there was a gem *Mirapecten moluccensis*. Being the greedy little pecten collector that I am, I quickly set the shell down to look for another. But as you may have expected, that was the only one. However, what I did find was very unusual. It was just a *Mirapecten thaanumi*, but it was tilted in the opposite direction.

Any of you who are familiar with *Mirapecten* know that *thaanumi* and *mirifica* are extremely oblique. So, when I say, "tilted in the opposite direction," I mean nearly 30 degrees off from the norm. No, I have not been drinking, and I'm wearing new glasses. I know in gastropods, when the spiral goes in the opposite direction, we call it "sinistral." What is it called, when this type of anomaly happens in bivalves? bkraines@eee.org

...and Gary Rosenberg at the Academy of Natural Sciences, Philadelphia, replied:

Sounds like you have a case of transposition. This is reported in bivalves, usually when the hinge teeth expected in one valve are seen in the other. For a review of the phenomenon see: A. Matsukuma. 1996. Transposed hinges of bivalve shells: a polymorphism of molluscan shells. *Journal of Molluscan Studies* 62(4):415-431. This paper does not mention transposition in pectens. Presumably the ctenolium is in the left valve instead of the right? (For non-pectinophiles, the ctenolium is the little comblike structure on the bottom valve of the scallop, under the more strongly notched ear. It functions to spread out the byssal threads.)

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On "Mollusckque" Revisited

Andy Rindsberg wrote:

Speaking as someone who studied linguistics before moving to paleontology, I would like to point out that dictionaries are not the final authority in deciding the meaning, usage, and spelling of scientific words. Scientists are.

In linguistic terms, some dictionaries are "prescriptive," meaning that they insist on correct usage as shown in the dictionary. Others are "descriptive;" that is, they simply describe current usage. Most dictionaries used to be prescriptive, though no English-language dictionary has ever had legal authority. (Some French dictionaries have had legal authority.) In this permissive age, most English-language dictionaries are descriptive.

In a dispute over words, I'd pay more attention to Tucker Abbott — or Gary Rosenberg — than to Merriam-Webster. Where do you think Merriam-Webster gets its definitions? A panel of experts. And who are these experts? How about that!

When the experts disagree, it is usually because the language itself is becoming more regular. In American English, words that end in -sc are being replaced by their counterparts ending in -sk, e.g., disc, disk, mollusc, mollusk. The -sk ending is more regular in English, but the -sc words were borrowed from other languages. The originally Latin "ae" is being replaced by "e" in many American English words: "aeon/eon," "palaeontology/paleontology," and sometimes even "archaeology/archeology." The change is taking place at a different rate for each of these pairs, and British English has retained the original spellings. Taxonomists are often antiquarians, of course, and may

retain an older word usage long after everyone else has made the change. So don't get too upset when there is no definitive answer to these questions. Just wait a century, and all will become clear! arindsberg@ogb.gsa.tuscaloosa.al.us

On Measuring Shells

In December, Debbie Wills asked:

What is the correct way to measure shells? (Bivalves in particular)? Yes, I know that shells are measured in metric terms (mm, cm) and it's best to use good, graduated, metric calipers. It is also my understanding that shell height is measured from the apex (top) to the end of the siphonal canal for snails and from beak (top) to shell margin (edge) for bivalves. Width (length) in bivalves is measured between posterior and anterior edges.

Well, this works OK on shells that are fairly symmetrical with the beak in the middle and centered over the shell margin, but what about those bivalves where the beak and shell margin are "skewed"? Also, what about the snails that are "off center"? How does one measure those shells?

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Travis Payne responded:

The proper way to measure a shell depends upon whom you ask. For me and most people, it is the greatest diameter. I have been told that the proper way was along the axis of the shell, even for cowries or cones, and this is usually NOT the greatest length. If you measure a cowrie in calipers, the greatest length will come when the shell is at a slight angle; for example, the "right" edge of the posterior canal and the "left" edge of the anterior canal would be touching the calipers, at least on cowries with uneven canals. Again, I'm not an expert, but I'm told that this isn't actually the correct way of measuring them. This is more difficult to see, because you have to guess where the axis is on some shells. This is why the new catalog of world size record shells abandons the traditional way and accepts the greatest diameter in any direction.

In bivalves, length is anterior to posterior, height is dorsal to ventral, and width is measured laterally, that is, from the outside of the left valve to the outside of the right valve. They are the most confusing. If you measure a scallop diagonally from one "ear" to the outer lip, you'll get a length that is sometimes 10-20 mm longer than just the dorsal to ventral distance straight across the shell's "axis."

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Bob "MakuaBob" Dayle replied:

The major part of my naval service was in the field of Metrology and while I'll outright deny being "expert," I am "experienced." For items as variable as biological specimens, some conventions must be agreed upon or the measuring can't really begin.

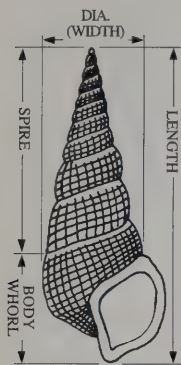
I'll have to ask, "At a slight angle to what?" The link given in my previous posting leads to a statement that the preconceived notion of right-angled relationships must be abandoned. There are too many forces acting upon growing organisms to expect them to assume crystalline structuring.

It would help to know who told you what wasn't the correct way because I wasn't in on that discussion. Zoological specimens...just grow according to their environment's effects upon their genes' commands. In the real ocean, it's far from being a clinical process.

That's probably reasonable for many bivalves, but most gastropods have a circular profile in only one of their three axes and the axis with the greatest length isn't circular in very many (if any) of them, so using the term "diameter" is somewhat confusing.

This is hardly a critique [of] Travis's posting. He brings up some valid points. I'm speaking only for Cypraea because I've measured some 20,000 of them in the past 15 years....Certain cowries show a tendency to have their greatest length on both ends of the labium while others may be longest from the anterior columellar extension to the posterior labial extension. Still others can be the opposite way.

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Then Paul Monfils came into the discussion:

The question of shell measurements is a recurring one, it seems — no surprise, with so many people studying, exchanging, buying and selling specimens. It seems almost intuitive that a standard system would be needed — until you try to come up with one. For a malacologist doing a comparative morphometric study, a standard system may well be essential. But for the average “sheller,” the only reason for measuring a specimen (if you’ll pardon my stating the obvious) is to answer the question, “How big is it?” in a way that can be conveyed to others. This, I think, is no small consideration, for if this is your objective, it soon becomes apparent that no

universal system will allow you to address that question accurately in all cases. As Debbie said, most bivalves can be readily measured either by height (umbos to opposite margin) or width (anterior end to posterior end). (“Width” here is really a conchological convenience — in any other animal specimen, including gastropods, the anterior-to-posterior distance would be called “length.”)

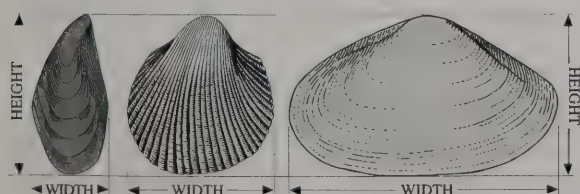
In many bivalve families, the typical shape of specimens is roughly circular or broadly oval, and in such groups (Veneridae, Semelidae, Cardiidae, Glycymerididae, etc.), either system of measurement can provide a reasonable answer to the basic question, “How big is it?” as long as all concerned are aware of the measurement being used. But not all families are so typical. In Tellinidae, the width may be three times the height. Saying that a tellin shell is 25 mm in height doesn’t address the “how big” question very well if the shell is also 75 mm in width. In Pholadidae, the width may be 4 or 5 times, and in Solenidae 6 or 7 times the height. What value is there in describing a 150 mm *Ensis* as being 25 mm in height? So maybe we should forget about height, and just use width as a standard?

But wait! In Mytilidae, the height may be 3 or 4 times the width; likewise in some species of Limidae and Pinnidae. And even some of the relatively “typical” families include exceptions, such as *Laevicardium attenuatum*, which is twice as high as wide. For these forms, only height gives an accurate picture of “how big.”

In a few forms, even such “standard” measurements are precluded by the shape or structure of the shell. The commonest example of this is the genus *Corculum* (the “heart cockles”) in the family Cardiidae. The height of such a specimen can be measured easily enough (though not from the umbos, which are deeply underturned). But the shell is so compressed in the anterior-posterior plane that what appears to be the “width” of the specimen is actually the lateral measurement (left to right, rather than anterior-posterior) — so when we speak of the “width” of such a shell, we are actually referring to an entirely different measurement than we would use to describe the width of other bivalves.

While I’m on the subject, I might note that there are many gastropod species for which the “standard” measurement of “length” (apex to tip of siphon canal) does not readily apply. These are, again, forms which are compressed antero-posteriorly until their “length” no longer exceeds the greatest diameter of their whorls. Examples include *Architectonica*, *Xenophora*, *Polinices*, *Guildfordia*, many *Astraea* species, and many land snails. For these forms, the diameter (or width), and not the length, is generally accepted as the “size” of the specimen.

So, in the final analysis, it seems unlikely that any system other



than that of “greatest measurable dimension” is likely to come into common usage. As Travis Payne pointed out, it is possible to eke a few extra millimeters out of a specimen by measuring it at odd angles. My personal prejudice is that shells should be measured along the obvious structural axis. I feel that this is a more “honest” measurement, and it is how I measure specimens.

One final consideration. Some gastropods have extensions of the lip (*Strombus taurus*, *S. tricornis*, *S. gallus*, *Lambis*) or posterior spines (*Murex pecten*, *M. troscheli*) that extend well beyond the apex of the shell. The primary length measurement of such specimens should be made from the apex to the anterior end of the shell. An additional “overall” measurement can be provided in addition, if desired. Likewise, for specimens having long extensions that protrude radially beyond the main body of the shell (*Guildfordia yoka*, *Angaria vicdani*, *Xenophora* with attachments, *Spondylus*), a measurement of the shell body should be provided, again with an optional “overall” measurement, including the span of the spines, if desired.

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Another closely related topic Paul addressed earlier was that tricky subject of spire angles:

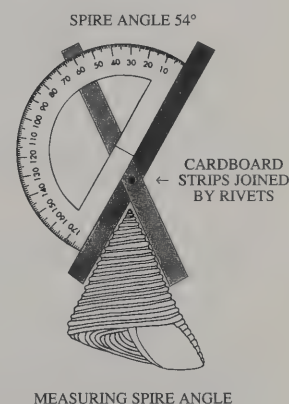
I think the easiest way to measure a spire angle on a medium to large shell is to use two strips of rigid cardboard or plastic, fastened together at one end by a rivet or other fastener, in such a way that they can be opened like the blades of a pair of scissors. The fastener should be tight enough so that there is some resistance to opening them, and they stay at the angle at which they are set. Just align the inner edges of the two strips with the sides of the spire, with the shell apex at the inner junction of the strips. Then it is an easy matter to remove the device from the shell, and measure the interior angle between the strips, using a standard protractor.

For very small shells, you might try making a mini-protractor, for taking direct readings under a dissecting microscope or other magnifier. I haven’t actually tried this with a protractor, but I have used this method to produce greatly reduced versions of other scales and grids, for use under the microscope, and I believe it should work just as well with a protractor.

Using a standard protractor, I would make a drawing of the protractor scale on a white sheet of paper (preferably using black drawing ink). Then I would place the drawing on a copy stand, and photograph it with a 35 mm camera. The resulting image on the film itself can be used as a mini-protractor. Just cut the appropriate frame from the developed film, tape it to an index card or other white support, and you can position a small shell directly on the scale, under the microscope, to take a direct reading of the spire angle.

Depending on the size of the original drawing, the lens you are using, and the distance from camera to subject, you can produce a protractor anywhere from 36 mm down to a few mm in overall width. It’s best to use a fine-grained film (slow speed, low ISO number). I use transparency (slide) film, so the image on the film is black on white, like the original drawing. However, you can use print film if you want it reversed — white image on black background. With slide film, overexpose at least an f-stop past the settings indicated by the light meter. With print film, underexpose by the same amount. If you are having the film processed commercially: for slide film, tell them “develop only - do not mount”. For print film, “develop only - do not print”. You could try shooting the protractor itself on the copy stand, instead of redrawing it, but I think you’ll get a much sharper result working from a black and white drawing.

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BOOK REVIEW:

Couch, K.J. 1997. *An Illustrated Guide to the Unionid Mussels of Kansas*.

Privately published, Olathe, Kansas. 123 pages.

The naiades (bivalved freshwater mollusks) are worldwide in distribution but reach their greatest concentration in the United States, with over three hundred species, located mostly in the eastern United States. Proceeding westward from the Mississippi River, the numbers of naiades fall off rapidly. By the time the Great Plains are reached, the numbers of naiad species drop to virtually nothing until you reach the waters feeding the Pacific coast.

From this geographical assessment, you might think the Kansas area "naiad-challenged". And, you might also think naiades are "ditch-water brown" ugly things not worth a second glance. Karen Couch's book would prove you wrong on both counts. *The Unionid Mussels of Kansas* may well be the most beautiful publication of illustrations of shells done in this country this century: marine, land or freshwater.

Shell enthusiasts had few popular works for midwest mollusks. Kansas was subject of an important identification book, *Handbook of Unionid Mussels in Kansas* by Dr. Harold Murray and A. Bryon Leonard in 1962. Growing up in Illinois, I used my copy of Dr. Paul Parmalee's *The Freshwater Mussels of Illinois* (1967) so much that it is falling apart with the covers missing, but it, like the Kansas work, was one of the few books we had. Both the Kansas and Illinois books had only black and white illustrations.

In 1984, *Missouri Naiades* by Ronald Oesch was a great breakthrough in what an identification book should be; with considerable information on the life history of the species, and to this reviewer, considering the amount of material packed into such a small and inexpensive book, the benchmark for any naiad work. But the line drawings were still in black and white. Even when color photography began to be used, as in the excellent *Field Guide to Freshwater Mussels of the Midwest* (1992) by Kevin S. Cummings and Christine A. Mayer the value of color was lessened by failure to include illustrations of the interior nacre. Interior color and also illustration of the lateral and pseudocardinal tooth structure are extremely useful in naiad identification. The fine *Freshwater Mussels of Texas* (1996) by Robert G. Howells, Raymond W. Neck and Harold D. Murray (yes, the same Harold Murray of the 1962 *Unionid Mussels in Kansas*) has color illustrations that are unfortunately so small as to limit their usefulness. The black and white illustration drawback is eliminated in this Kansas guide.

Getting Away With Murder

by Bill Frank

The Florida Queen Conch population has suffered serious depredation at the hands of poachers [*Florida Sportsman Magazine* Jul., Nov, 1997; *Miami Herald* May 15, 25, Sept 3, 1997]. On May 9th, a Biscayne Bay National Park field ranger, during a routine inspection of divers who were not displaying a dive flag, discovered five Hialeah residents in possession of 458 protected Queen Conch (*Strombus gigas*), a slaughtered endangered Loggerhead sea turtle, 37 illegal fish, and two lobster tails. The contraband was confiscated and the poachers were charged with violating the Endangered Species Act and the Lacey Act. As a result of the charges the poachers faced a maximum of five years in jail and up to \$250,000 in fines.

"This one violation is incredibly significant," commented Bob Glazer, Program Director at the Federal Marine Research Institute (FMRI) on Long Key, who is working to restore Queen Conchs to the Florida Keys. "What they took may have been an entire spawning aggregation, and that represents a major loss to the stock that will take a long time to recover."

In subsequent court action in September, the poachers were convicted and received three years probation, 100 hours of community ser-

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The book has a very simple but effective technique in highlighting portions of the text describing important features of the shell. All shell illustrations are in full color. The size of the illustrations is helpful; most are shown full size or even larger than the specimen they represent. There are even side views of some Anodontinae, which are great. Where the shell displays considerable variation and color differences, as in *Pleurobema coccineum*, numerous specimens are well illustrated except, unfortunately, where only the male *Ligumia recta* is shown.

The range of the species is always interesting to the extent that a shell might be rare in Kansas but common elsewhere. A little more on the health of the species and overall range would have been beneficial. Murray and Leonard's *Unionid Mussels in Kansas* provides the range of the species (unfortunately in a very small map), but including such a map in the Couch book would have been desirable. Using the Couch book for illustrations and good visual i.d. and Murray and Leonard for additional data provides great coverage for the state's mussel fauna.

I looked in vain to find identification of the shell on the penultimate page of the book — a lumpsilid with its fish-like mantle lure exposed — and a wonderful illustration, by the way. The author informed me it was not a Kansas mussel at all. It would have been so much nicer had the book illustrated one of the Ozarkian (an endemic fauna zone which extends into Kansas) lumpsilids which also demonstrate that fish lure trait.

If you are a shell generalist, and want just one reference book on freshwater mussels, obtain this book. It does not have the detail of Ron Oesch's *Missouri Naiades*, my measure of a great work. But Couch's book is one that will make even the most hardened "mariner" (those people who actually think shells come from the sea, what a concept!) know what the "mussel-heads" already know: the freshwater naiad fauna is beautiful, interesting and worth studying. The author's excellent drawings are works of art. I predict some books will end up with pages removed and framed as individual art prints. The book is spiral bound so that the pages lay flat, a real plus; don't you hate it when you have shells in both hands trying to compare specimens to a picture, while the book pages keep closing? The illustrations remind the reviewer of the works of John James Audubon. But unlike Audubon who shot numerous specimens and wired the birds in life-like positions in order to paint them, Couch has done almost the opposite. She has taken subfossil specimens of species extirpated from Kansas and recreated them in their full lifetime glory, and she has provided a plea to help preserve this unique and fascinating fauna.

The book is available from the author at 12 Ventura Lane, Olathe, KS 66061-3057 at \$60.95 postpaid in the U.S. —Alan Gettleman

vice devoted to environmental cleanup, and a three-year ban from all national parks. There was speculation that the defendants were planning to sell their "catch," but prosecutors were unable to prove this in court; hence the relatively mild sentence.

The commercial harvest of the Queen Conch (*Strombus gigas*) from Florida waters has been prohibited since 1978, and a total ban on collecting has been in effect since 1986. The species was subsequently added to Appendix II of the CITES (Convention on International Trade in Endangered Species) list, which imposes restrictions on import/export, in November 1992. Despite this eleven year moratorium, there has been zero recovery in Florida's Queen Conch numbers and, according to Bob Glazer, the Keys have lost 90 percent of their spawning adults.

The FMRI has been raising conch from Florida broodstock and releasing them into the waters off Marathon. As of early 1997, the FMRI had released some 4,000 juveniles into the wild and last summer recorded an 18 percent survival rate, which according to Glazer, was "better than we thought."

The fact that this human intervention on behalf of the Queen Conch over several years may have optimally resulted in only 720 new conch in the wild sorely demonstrates the seriousness of the killing of 458 breeding specimens in a single incident, but it also suggests the possibility of a gross underestimation of field stocks.



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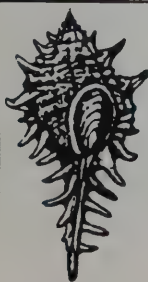
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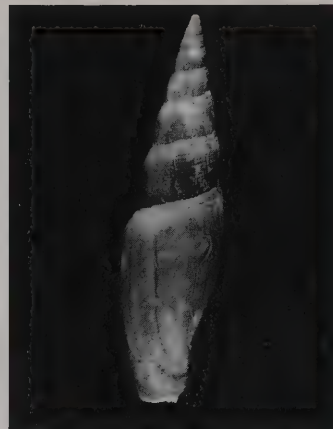
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PLEIOPTYGMATIDAE, MITRIDAE AND VOLUTOMITRIDAE OF THE WESTERN ATLANTIC

By Kevan and Linda Sunderland



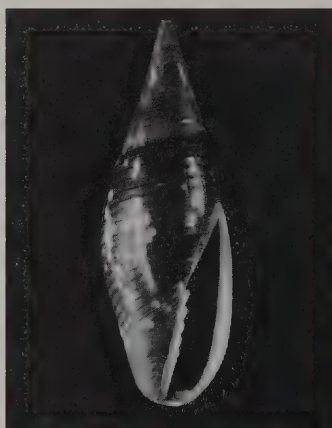
Pleioptygma helenae (Radwin and Bibbey, 1972). 115mm. 80' in sand in reef, off Caribbean Nicaragua.



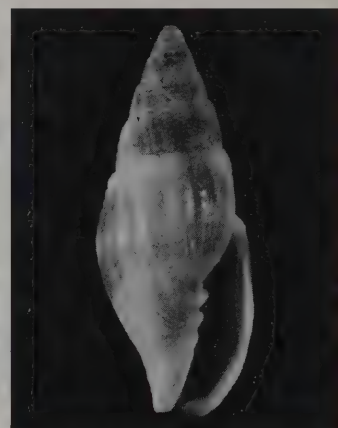
Mitra antillensis Dall, 1889. 84mm. 100 fathoms, dredged off Dania, Florida.



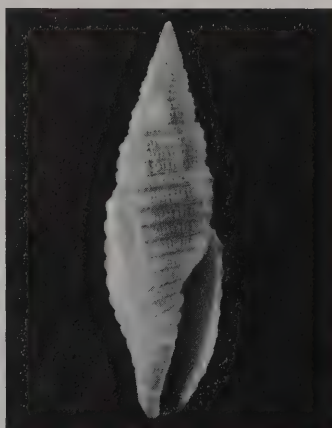
Mitra barbadensis (Gmelin, 1791). 35mm. 70' in reef, at night, off Rose Hall, Jamaica.



Mitra brasiliensis Oliveira, Almeida, Vieira & Oliveira, 1969. 27mm. Shallow water, in reef, Salvador, Brazil.



Mitra leonardi Petuch, 1990. 23mm. 60 meters, dredged off Portobelo, Panama. PARATYPE, collected by James Ernest.



Mitra nodulosa (Gmelin, 1791). 38 mm. 10' in rubble, Pickles Reef, off Key Largo, FL.



Disclaimer: The intent of these centerfolds is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.

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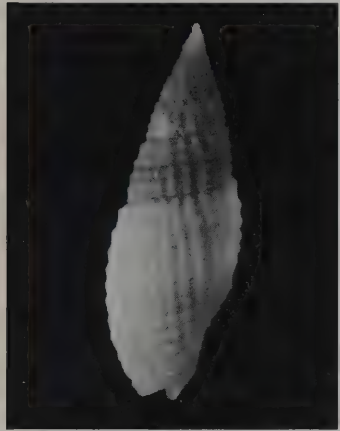
References:

- Abbott, R.T. 1974. *American Seashells*, 2nd Ed.
Cernohorsky, W.O. 1978. "The Taxonomy of Caribbean-Atlantic Costellariidae (Mollusca: Gastropoda). *Rec. Auckland Inst. Mus* 15:87-109.

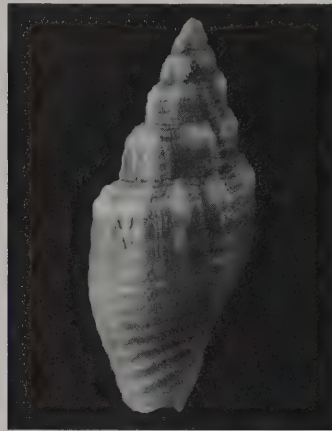
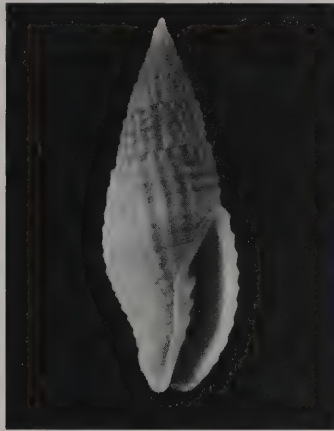
Every now and then you meet a special person you will always remember. Once in a lifetime, you meet a person like Len Hill. Linda and I were fortunate to know Len well. He was a special person to many of you who read this magazine about the hobby we love, and he was a true collector, whether it was old glass, pre-Colombian artifacts, or his wonderful shells. Boy, did Len know his shells — well enough to be an author, shell dealer and respected authority on many families.

Because of his love of miters, we dedicate this group of photos to him. Len has been after me for years to do miters and vexillums for the *American Conchologist*. This one is for you, my friend, We truly miss you!

Oh, by the way, we sure could use some help with the blasted vexillums!



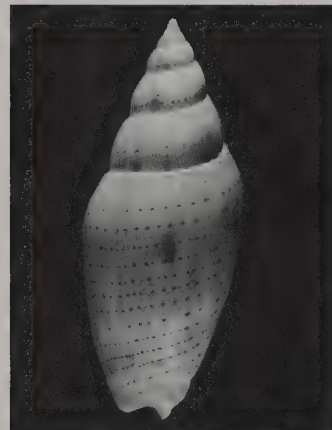
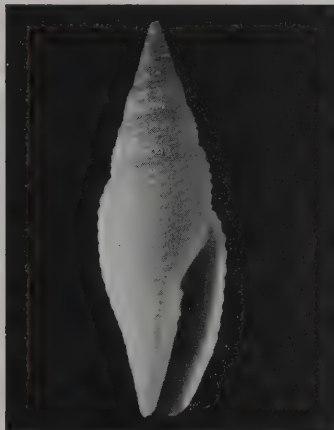
Mitra pallida Usticke, 1959. 27mm. 10-25' in rubble, Pickles Reef, Key Largo, FL.



Mitra semiferruginea Reeve, 1845. 34mm. 40' in sand, Clifton, New Providence, Bahamas. Ex Dieter Cosman collection.



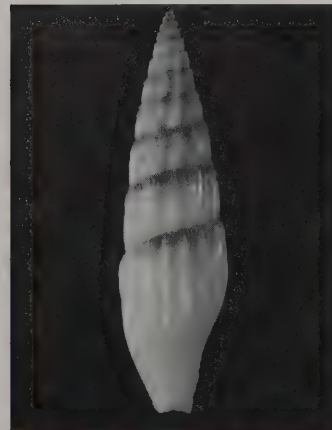
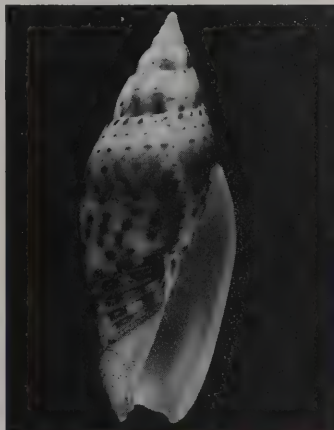
Mitra straminea A. Adams, 1853. 31mm. 80 fathoms, dredged off Key Largo, FL.



Dibaphimitra florida (Gould, 1856). 73mm. 20-60' at night, Pickles Reef, off Key Largo, FL.



Dibaphimitra janetae Petuch, 1987. 67mm. Dead in lobster traps, in sand in reef, off Eastern Honduras.



Volutomitra bairdii (Dall, 1889). 35mm. 700-1000 meters, 200 miles off the Cape Fear River, NC.



Dall, W.H. 1881. Report on the Mollusca, Part II. Gastropoda and Scaphopoda. Reports on the results of dredging in the Gulf of Mexico (1877-78)...Steamer Blake. *Bulletins of the Museum of Comparative Zoology of Harvard*. 18:1-492.
Kaicher, S.D. 1974a, 1974b, 1976a, 1977d. Card catalogue of world-wide shells. Packs #

3, 4, 9, 15 — Mitridae Parts I-IV. S. D. Kaicher: St. Petersburg, Florida. cards [i-ii], 196-389, 798-903, 1435-1540.
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CONCHATENATIONS: Donating Collections

by Gary Rosenberg

I have noticed in recent years an increasing perception among conchologists that museums do not want their collections. Accompanying this is an increasing reluctance to donate collections to museums, because shells will be "locked away" where no one can see them. To illustrate sometimes contrasting perceptions and expectations of donors and recipients, I discuss here the terms under which my department accepts collections, and point out a few legal issues. Yes, we still accept, and even recruit, donations of shell collections.

Terms and conditions

1. *We cannot agree to keep all the material in a collection;* some might be given or traded to other institutions, used for teaching by other departments within the museum, or sold in a public sale, such as an auction. (Accredited museums in the United States are not allowed to sell material privately.) We might keep anywhere from 5% to 100% of a collection. Before accepting donations, I inform donors how much of their collections we are likely to incorporate into our permanent research collection. If we do not keep material, it is usually because of poor locality data, or because the material duplicates our holdings.

2. *We cannot keep an individual's collection together.* If we had twenty separate collections, finding all the specimens of a particular species would be difficult. Therefore, anything that goes into the research collection is integrated in systematic order with the rest of the collection. The label with each lot states who donated the material. Also, everything catalogued into our collection since 1976 is computerized, so it is easy to generate a list of material donated by a particular person. This data is also available on Internet. For example, to see what Marvin Hyett or C. L. Richardson donated to us, search by last name at <gopher://erato.acnatsci.org:70/11/mala>

3. *We cannot agree to put something on display in perpetuity.* We have fourteen million specimens, so only the smallest fraction will ever be on display. The specimens are not "locked away," however. We give behind-the-scenes tours by appointment and during the annual Philadelphia Shell Show, which is held at the museum. Scientists from all over the world visit the collection and request material on loan. Amateurs engaged in taxonomic research are also allowed to use our collection and library. The availability of collection data on Internet potentially makes our specimens available much more widely than they would be in a private collection. Recently acquired digital imaging equipment allows us to distribute images of specimens to researchers on request via Internet.

4. *The donor must have acquired all donated specimens legally.* This will cause increasing problems in the future, because laws for collecting permits in various countries are becoming stricter and more complex. Institutions will have to stop accepting collections if donors are unable to establish clear title to the specimens. How many of you have specimens from the Galapagos in your collections? If they were collected after around 1980, they were probably acquired illegally. If they were collected before 1980, can you prove it? — do you at least have a label that looks twenty years old? If you have a specimen of an endangered species in your collection, can you prove that you got it before the species went on the endangered species list? Keep all the documentation (original labels, correspondence, invoices, collecting permits) for specimens in your collection; it will be valuable. Collectors who plan to donate their collections in thirty years should establish a relationship with an institution now. The staff there can advise on getting collecting and import permits.

5. *Financial support is appreciated.* Our cost for housing specimens is about \$0.20 per lot per year. This is just the cost of keeping the roof on the building, heating, air conditioning, sweeping the floor, etc. I calculate this as follows: we have about 460,000 lots, and the department takes up 11,000 square feet. Our overhead cost is \$8.40/sq. ft, averaged over the whole museum. Library and offices occupy some of our space, but literature and people are necessary to maintain the collection, so considering all department space as supporting the collection is reasonable: \$8.40/sq. ft/year x (11000 sq. ft./460000 lots) = \$0.2009/lot/year. To "endow" a lot would cost \$4.00. The U.S. stock market returns 10% in the long run (and non-profit institutions don't pay tax), so \$4.00 yields \$0.40/year, half of which pays the annual cost of overhead for the specimen, and half of which is reinvested so that the endowment keeps up with inflation.

In addition to the annual maintenance cost, there is an initial cost to catalogue a specimen, which ranges from \$2 to \$5 per lot, depending on how much curation a collection needs. This is the cost to sort the donated material, identify it (or confirm the identification), rehouse it in standard vials and boxes, computerize it, print acid-free labels, and distribute it to the proper place in the collection. Our ultimate total cost per lot is \$6 to \$9: \$2 to \$5 per lot for curation plus \$4/lot to house it forever. Thus incorporating a collection of 10,000 lots costs us \$60,000 to \$90,000. That is why museums think twice about accepting donations, and why they often ask for financial support for curation. Preserving scientifically important collections is our mission, but with limited funds and space, we have to be careful what we preserve.

What do Museums want?

Different institutions have different priorities. Some museums do not have space or funds to add material even if it is of scientific value. Others specialize in the fauna of a particular geographic area, since it will largely duplicate material that we have, generally has only one or two specimens per lot, and often has imprecise locality data. Such a collection might be very valuable to an institution that is trying to build a comparative shell collection (for example the Paleontological Research Institution in Ithaca, New York). We accept such collections for the same reason — they often contain species new to our collection. One man who donated his collection a number of years ago treated shells essentially like postage stamps. If he saw on a list a name that he didn't have in his collection, he bought it. He didn't know how to identify shells, so this procedure netted a lot of synonyms. In his collection of some 4,000 total, he also had 200 species that were new to our collection!

More scientifically valuable is a taxonomically specialized collection. The specialist pursues hard-to-get species, and develops series illustrating variation within species across their geographic ranges. Such collections often are worth incorporating into our research collection in their entirety, and can instantly give us good coverage of most of the species in a particular family. An example is Hal Lewis's collection of Ranellidae, which contained almost all known species in the family when he donated some twenty years ago. The collection also documented enormous range of variation. Last year I found that for twenty percent of its species it contained specimens larger than the currently listed world record.

Perhaps even more valuable is a self-collected collection focusing in depth on a particular geographical area. Such a collector learns the habitats of the animals, tracks them down in their lairs, and documents what they eat for breakfast. Such a collection is most likely to contain random samples that document range of variation in natural populations of a species. All too often specimens are sorted, culled, and traded — the big purple ones end up in a collection in Japan, the small pink ones end up in the United States, and dumpy gray ones go in the rubbish heap. The taxonomically specialized collector eventually pieces

together the range of variation for each species, whereas the self-collector is at the source and sees the species in action. An example is the Jack Worsfold collection of mollusks from Grand Bahama Island, one of the few collections that we have ever purchased. Worsfold collected around a thousand species on Grand Bahama Island alone, documenting date, depth, and habitat with each lot. The collection contained around 8,000 lots and untold thousands of specimens, many of them micromollusks and undoubtedly many undescribed species.

Although we prefer the precise, reliable locality data associated with self-collected material, *the importance of locality data varies with the species*. If we do not have any specimens of a species, we will catalogue a specimen without any locality data whatsoever. We are not fussy about data if we have fewer than ten specimens of a species. If we have several hundred specimens of a species, we might insist on having detailed ecological information for additional specimens, and we might prefer large lots to individual specimens. Fifty specimens from fifty sites occupy far more room than fifty specimens from one site, and take far more time and materials to catalogue. Our smallest box size is 1 x 3 inches, so for many species, ten or even one hundred specimens take up no more room than one specimen.

What do collectors want?

Collectors often want their collections to be on display. Unfortunately, this is unlikely to happen. The research collection staff seldom controls exhibit space in museums. Also, most natural history museums have far more objects than they can ever display. If display is truly important to you, shop around for a smaller institution that might want a special attraction.

Collectors want their collections to be available for future generations. To ensure availability of your collection, look for an institution that has a history of research in malacology, and currently active staff. Most university collections end up orphaned because of changing

research emphasis. Our collection includes the collections of the University of Pennsylvania, Alfred University, and Syracuse University, and part of the Princeton University collection. If you plan to donate your collection, even far in the future, talk to the institution now to make sure you have a mutual understanding.

Collectors want a tax break. The best part about donating a collection is that it can bring a better financial return than selling it, especially if you are in a higher tax bracket. The worst part about donating a collection is arranging for an appraisal. The Internal Revenue Service (IRS) considers it a conflict of interest for the recipient of the donation to appraise it, and even frowns upon an institution recommending a particular appraiser. At best, the institution can provide a list of qualified people. An appraiser can be anyone with experience in identifying and pricing shells. Generally this means a shell dealer, but some museum curators are also qualified.

If the IRS challenges your appraisal, it will want to know the qualifications of the appraiser: for example, how long he has been in business, and appraisal method used. Method of appraisal might be item by item, or a standard average value for most lots, with rarities appraised individually. Method of appraisal also includes a statement of references used, such as Tom Rice's compilation of dealer prices. If a lot has more than a certain (unspecified) number of specimens, the IRS might expect appraisal at wholesale instead of retail value. Appraisal for a percentage of a collection's value is not acceptable, as it creates a conflict of interest. Expect to pay for an appraiser's travel, and an hourly or daily rate.

One more possibility is pending — if COA succeeds in getting its tax status changed, you will be able to donate your collection to COA, watch the feeding frenzy at the auction, and get that tax break, all for the benefit of educational grants, or some other conchological purpose that you might designate.

Department of Mollusks, Academy of Natural Sciences, 1900 Benjamin Franklin Parkway, Philadelphia, PA Email: rosenberg@acnatsci.org

World Congress of Malacology Follows COA

This July will see a first in world malacology: the American Malacological Union Annual Meeting for 1998 will be held jointly as a part of the first World Congress of Malacology, July 25-30, 1998 at the Smithsonian Institution, Washington, D.C. Sponsored by the Smithsonian, the AMU, and Unitas Malacologia, the congress will receive support from the Western Society of Malacologists and the Field Museum of Natural History in Chicago. Malacologists are expected to attend from all over the world. The highlights of the scientific session will be three symposia. They are:

* *Refining Molluscan Characters*, an overview of the major classes of data sets, including anatomy, shell morphology, molecules, behavior, and development, examining how we define molluscan characters now, and future directions in the field.

* *Interactions Between Mollusks and Humans*, an exploration of current uses of mollusks in medical research, biodiversity studies, and fisheries.

* *Bridging Temporal Scales in Malacology*, uniting the Living and Dead, an investigation into the removal of temporal boundaries between the living and the fossil fauna in the study of mollusks.

This entire conference will be a gala event, set in our nation's capital and showcasing the collections of our National Museum as well as the history, the sights, the museums and the architecture of our nation's capital. In addition to a social, auction, President's Reception, dinner cruise on the Potomac and obligatory banquet, a field trip to the spectacular Miocene fossil beds in Calvert County, Maryland, will be featured Friday, the day after the congress ends.

Any COA member who is at all interested in the science of malacology, the directions it is taking, or the scientists and students doing the research will surely want to be in Washington, D.C. for this unique opportunity. The local contact is Dr. Robert Hershler, President of the AMU (hershler.robert@nmnh.si.edu).

Siratus Returns

How pleased we were with our morning mail one day in January! *Siratus*, publication of the Conchilologistas do Brasil, has returned. The Conchilologistas will be publishing *Siratus* on an irregular basis, says editor Jose Coltro, Jr., "one or two magazines per year as a way to help young scientists from Brazilian universities and museums." Whatever the frequency, we are delighted to see its return. This issue, number 13 (October, 1997) contains articles on marginellids, a faunal distribution for the Rio de Janeiro area, an article on feeding habits of a molluscivorous fish, and description of a new cone from reef areas off Bahia Coast, Brazil, *Conus bertarollae* Costa and Simone, 1997. To obtain a copy, write to Siratus at P.O. Box 15011, Sao Paulo SP, Brazil 01599-970. Price: \$7.00 U.S. for North and Central America.

What is really needed is the amateur who treats the mollusk as a living animal, not one who treats it like a stamp and adds a new and rare variety to his collection as his greatest personal satisfaction. — David Nicol, 1953, *The Nautilus* 67, as quoted in the ATSC Capsule 30(1).

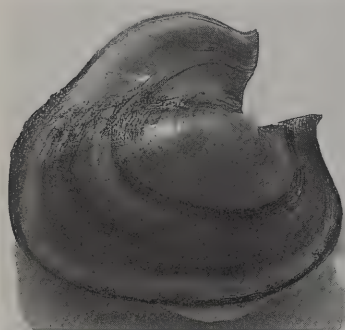
A Tale of Two Species?: Investigations Into The Natural History And Systematics Of *Potamilus inflatus*

by Kevin J. Roe

Freshwater mussels have been profiled in previous issues of *American Conchologist* (for a thorough overview of their natural history and an outline of some of the factors affecting their survival, see *AmConch* June/September 1994). In 1995 I began my doctoral studies in systematics at the University of Alabama in Tuscaloosa. Although originally interested in ichthyology, I did work on a project involving freshwater mussels which introduced me to these fascinating organisms, and I was instantly hooked.

My first project involving freshwater mussels was a study of the inflated heelsplitter, (*Potamilus inflatus*), a small to medium-sized

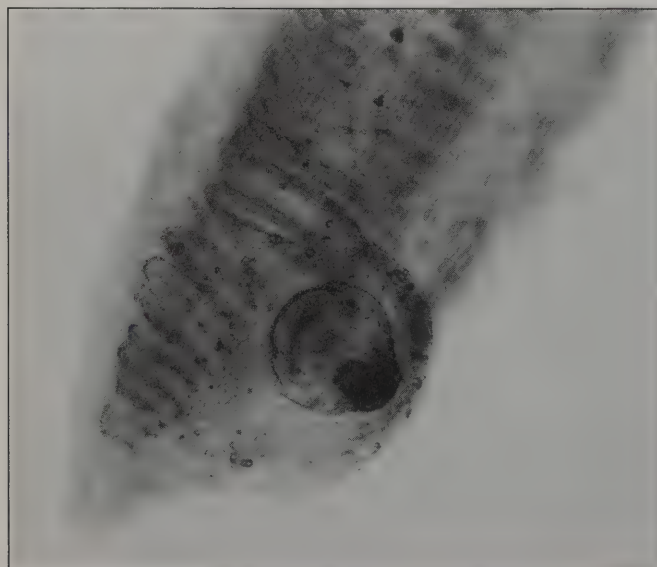
freshwater bivalve. The shells are quite thin and the periostracum ranges from a slightly iridescent light brown in young mussels to a dark brown in older individuals. The shells are somewhat inflated, particularly near the umbo, but their most distinctive features are the presence of large anterior and posterior "wings." The inflated heelsplitter was once widely distributed; unfortunately, as is the case with many other species of freshwater mussels, populations of *P. inflatus* are now greatly



Potamilus inflatus (female) from the Black Warrior River, Tuscaloosa County, AL. Photo by A.M. Simons.

reduced. Whereas they were once distributed across much of the southeastern United States, they are now restricted to portions of only two rivers, the Amite River in Louisiana and the Black Warrior River in Alabama. This decrease in range and the continued threats to the survival of the inflated heelsplitter led to its listing as a federally threatened species.

Biodiversity and Systematics, Box 870345, 425 Scientific Collections Building, The University of Alabama, Tuscaloosa, AL 35487-0345
Email: kroe@biology.as.ua.edu



Potamilus inflatus glochidia encysted on gill filament of freshwater drum. Photo by A.M. Simons.

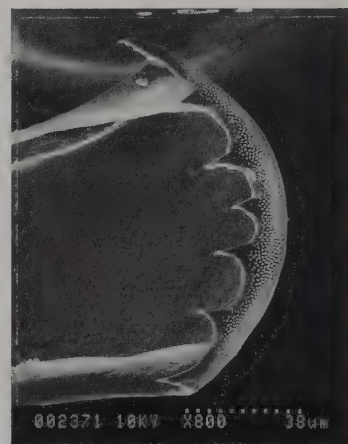
The goal of my project was to identify the fish host for its glochidia larvae; unlike other bivalves, the larvae of freshwater mussels are parasitic and must attach to a vertebrate host (usually a fish) to complete their development. Some species of freshwater mussels can successfully parasitize many different species of fish, while others are very host specific and must attach to a particular species of fish to complete their development. Glochidia of freshwater mussels vary in size and shape from species to species. Some of the smallest measure only 0.05 mm in height while the largest are about 0.3 mm. Their shapes range from spherical to axe-head shaped and many possess large "teeth" or hooks which are thought to aid in attaching to a host.

Identification of the fish host for the inflated heelsplitter was an important part of developing a strategy that would insure its survival. With the aid of U.S. Fish and Wildlife biologists a plan was developed to survey fishes in the Black Warrior River when female inflated heelsplitters were known to be releasing glochidia. The idea was to capture as many fish as possible and examine them for attached glochidia. The glochidia of *P. inflatus* have a distinct axe-head shape characteristic of the genus *Potamilus*; thus they can be distinguished from the glochidia of other freshwater mussels that also occur in the Black Warrior River.

Unfortunately, the glochidia are very small (<2 mm high) which makes them very difficult to see, and many hours were spent examining the gills and fins of over 800 individual fishes under a microscope. In the end we did find glochidia of *P. inflatus* on the gills of one fish: a freshwater drum, *Aplodinotus grunniens*. These results agreed with other studies which indicated that other species of *Potamilus* parasitized the freshwater drum exclusively. This level of host specificity is somewhat unusual, as many species of freshwater mussels appear to be able to parasitize several different species of fish. One of the implications of these findings is that the fate of *P. inflatus* as well as other members of the genus *Potamilus* is closely tied to that of the freshwater drum. Freshwater drum are fairly common in the Black Warrior River which indicates that at least this portion of the inflated heelsplitter's life cycle remains intact. Later investigations revealed the presence of juvenile inflated heelsplitters in the Black Warrior River, confirming that inflated heelsplitters were still successfully reproducing.

Another project involving the inflated heelsplitter was to determine if the two remaining populations were genetically similar to each other. The degree of similarity of the Amite and Black Warrior populations would also have strong implications for the formulation of any conservation plans aimed at preserving the inflated heelsplitter. If, for example, they were found to be genetically similar, they could be treated as a single entity for conservation purposes, and if one population was found to be declining in numbers it could be restocked from the other without fear of damaging the genetic structure of the declining population. If, on the other hand, the populations are very different genetically, the introduction of individuals from one population to the other could have disastrous consequences for the continued survival of the species.

In order to determine if these populations were genetically similar or not I sequenced a portion of the mitochondrial genome for several



Potamilus inflatus: interior view of one valve of a glochidia.

(Continued on page 21)

Submission of Digital Pictures for Inclusion in *American Conchologist*

by Ross Gundersen

When I did a short article for *American Conchologist* on micro-mollusks, I had been doing digital photography for several years. Therefore, I simply decided to send in the accompanying digital pictures by email to the publisher. I sent the pictures in the size I wanted them to appear. They replied that the pictures were not of high enough resolution. My response was "What the heck do you mean — the resolution is not high enough?!" After several weeks of talking to the publisher and sending sample pictures we finally had it figured out. Simply put, "the bigger, the better."

For those of you who are interested in traditional photography, you will understand that resolution is determined by the quality of your lenses and grain size of the photographic emulsion being used. Resolution in digital photography is also determined by lens quality, but grain size is replaced by the size of one pixel. The size of one pixel is fixed. In this case, assuming good lenses, resolution is increased by increasing the size of the photograph. This simply means spreading the image over a greater number of pixels. Therefore submit as large a digital photograph as possible. This does not mean taking a small photograph, 200 X 200 pixels and enlarging it to 500 X 500 pixels! Enlarging a digital photograph does not increase its resolution, but rather decreases it.

A modest sized picture of 1 3/4" X 2 3/8" should be submitted as a 480 X 360 pixel digital photograph. This will give the printers ample resolution to work with. An 800 X 600 pixel photograph is adequate for an 4" X 3" printed image. If you plan on an 8" X 10" picture then you had better submit a 2000 X 1600 pixel image. The simple rule is: The bigger the better.

Department of Biological Sciences, University of Wisconsin - Parkside,
P.O. Box 2000, Kenosha, WI 53141 Email: gundersr@cs.uwp.edu

There are several ways to obtain the suggested sizes of digital photograph: 1) digital camera, 2) digital or analog video camera with computer digitizing board, 3) scanning of slides and prints.

1) Digital camera

Your camera should be able to take and save the above pixel image sizes without compression. Compression decreases resolution! Watch out for cameras that give you an apparent high resolution by simply magnifying the image size (one pixel is now 4 pixels).

2) Digital/analog video camera with video digitizing board

Your analog video camera should have a resolution of 500 or greater video lines of resolution. The resolution of your digital video camera should be 480 X 360 pixels or above. The video digitizing board should have a similar or greater resolution. Once again, watch out for cameras/boards which simply magnify image size and don't compress the images.

3) Scanning of slides and prints

A 4" X 6" print should be scanned at a setting of 150 dpi or lpi (dots or lines per inch). This gives a digital image size of approximately 640 X 480 pixels. A 35mm slide should be scanned at 600 lpi to achieve an image size of 640 X 480 pixels.

Digital images can be saved in different formats. They should be saved using the TIFF (*.tif, without compression) or BMP (*.bmp) formats. JPEG and GIF formats should be avoided since they involve compression and reduce detail.

You should first consult with your editor and printer to determine the final size of your photograph in the *American Conchologist*, and then produce a digital photograph of appropriate resolution, saved in the appropriate format.

This article, along with a complete set of color figures, can be found at the following web address:

<http://www.uwp.edu/academic/biology/digital/digital.htm>.

WHAT IS IT?



Turricostellaria sp. 29mm. 700-1000 meters, 200 miles off the Cape Fear River, NC. Photo: Kevan Sunderland

Clues:

- | | |
|------------------------|-----------------------|
| 1. <i>Argopecten</i> | 11. <i>Chlamys</i> |
| 2. <i>Parvamussium</i> | 12. <i>Chlamys</i> |
| 3. <i>Flexopecten</i> | 13. <i>Pecten</i> |
| 4. <i>Chlamys</i> | 14. <i>Chlamys</i> |
| 5. <i>Chlamys</i> | 15. <i>Chlamys</i> |
| 6. <i>Decatopecten</i> | 16. <i>Chlamys</i> |
| 7. <i>Lissopecten</i> | 17. <i>Argopecten</i> |
| 8. <i>Bathypecten</i> | 18. <i>Chlamys</i> |
| 9. <i>Chlamys</i> | 19. <i>Chlamys</i> |
| 10. <i>Chlamys</i> | 20. <i>Chlamys</i> |

(Continued from page 20)

individuals from each population. Analyses of the sequence indicated that the Amite and Black Warrior populations are very different from each other; in fact they are more genetically distinct from each other than some other *Potamilus* species are from each other! Based on further analysis it was determined that these two populations represented "cryptic species," species which look the same but, based on other criteria, in this case DNA, are found to be very different. So instead of having just one species in two rivers, it now appears that there are two distinct species, one in the Amite and another in the Black Warrior.

Without a doubt, many more species of freshwater mussels remain to be discovered; some will be identified the old fashioned way by careful surveying and observation of shells and anatomy, while others will require the use of genetic techniques like DNA sequencing to uncover "hidden" variation. The end result will be a better understanding of the kinds and number of freshwater mussels that exist today. Hopefully this increased understanding will allow us to preserve the mussel species that remain with us, for ourselves and future generations.

SCUM II: SOUTHERN CALIFORNIA UNIFIED MALACOLOGISTS

by Lindsey T. Groves

The second meeting of Southern California Unified Malacologists (SCUM) convened at the Natural History Museum of Los Angeles County on Saturday, 10 January 1998, and was attended by 27 persons. SCUM is an informal association of professional, amateur, and student malacologists in southern California who are active or interested in Recent and/or fossil molluscan research. The purpose of the annual gathering is to facilitate contact and keep one another informed of research activities and opportunities. There are no dues, officers, or publications. SCUM is patterned after the Bay Area Malacologists (BAM) which has been hosted by malacologists at different institutions each year. The first meeting of SCUM was hosted by George Kennedy at San Diego State University, 11 January 1997 and attended by 21 people. More recently Tim Pearce (Delaware Museum of Natural History) has called for a meeting of Mid-Atlantic Malacologists (MAM) to be structured in the same fashion as BAM and SCUM. We indeed wish him well and hope to see more informal regional gatherings of professional and amateur molluscan researchers.

Hosts for SCUM II, James McLean and Lindsey Groves of LACM, welcomed the guests who introduced themselves and were given opportunity to briefly present details of their current molluscan research interests. These summaries stimulated numerous discussions and comments (see list below). Following the presentations Hans Bertsch (National University, La Jolla, CA) generously volunteered to host SCUM III in 1999. The world class Malacology and Invertebrate Paleontology research collections of LACM were then made available for inspection to all guests.

SCUM II attendees and their respective research interests and/or current activity topics are as follows:

Yvonne Albi (Nat. Hist. Mus. L.A. Co. volunteer): Currently describing a new species of Paleocene *Schizaster* echinoid (with LouElla Saul), and studying Pliocene/Pleistocene and Recent species of Bursidae.

Hans Bertsch (National University, La Jolla, CA): Teaching duties; continuing ecology study on Bahía de los Angeles, Golfo de California, Baja California Sur ecology; continuing biodiversity sampling project in Bahía Tortugas and Isla Cedros, Pacific side Baja California Sur; beginning a locality data compiling project focusing on Mexican specimens in American museums for analysis by Mexican agencies.

Hank Chaney (Santa Barbara Mus. Nat. Hist.): In charge of shell exhibits at Santa Barbara Museum; reviewing the complex endemic, Panamic, and Indo-Pacific mixture of species at Isla del Coco, eastern Pacific.

Lisa Crummett (Calif. St. Univ., Fullerton): Currently studying learning behavior and memory patterns of *Octopus dofleini*; participating in ecological and spatial research project on lottiid limpets (with Doug Eernisse).

George Davis (Nat. Hist. Mus. L.A. Co.): Continuing Masters thesis on Pliocene mollusks collected from strata beneath Arco Tower in downtown Los Angeles.

Doug Eernisse (Calif. St. Univ., Fullerton): Continuing molecular and morphological analysis of animal relationships using revised characters and chiton phylogenetic research.

Wes Farmer (San Diego Shell Club): Continuing photo documentation of Eocene fauna and flora from Torrey Pines State Reserve, San Diego Co.

Daniel Geiger (Univ. So. Calif.): Continuing PhD. research on abalone phylogeny and systematics; recently completed Pea Malacology & Invertebrate Paleontology Sections, Natural History Museum of Los Angeles County, 900 Exposition Boulevard, Los Angeles, California 90007 USA. lgroves@nhm.org

Crab/abalone commensalism project (with Jody Martin of LACM); continuing fossil abalone survey, which is ready for submission (with Lindsey Groves); refining digital publishing techniques.

Donovan German (San Diego St. Univ.): Researching fairy shrimp of vernal pools and predator/prey relationships.

Lindsey Groves (Nat. Hist. Mus. L.A. Co.): Continuing survey of eastern Pacific fossil and Recent species of Cypraea [number of species now over 80; new species still being found]; survey of Caribbean genus *Muracypraea* and its paleobiogeography continues; has begun update of Geological Society of America Special Paper 56 *Check list of California Tertiary marine Molluscs* by Keen & Bentson (1944) (with Richard Squires and LouElla Saul).

Carole Hertz (San Diego Shell Club): Editor of *The Festivus*; continuing comparison of Panamic species *Fusinus consagensis* and *F. fredbakeri* using statistical analysis of shell diameter and length.

Jules Hertz (San Diego Shell Club): Business manager of *The Festivus*; studying *Colubraria ochsneri* and a possible range extension (in press, see *The Festivus* 30:3).

Kim & Linda Hutsell (San Diego Shell Club): Recently published *Registry of World Record Size Shells* with Don Pisor, over 4400 entries; continuing worldwide survey of Recent Pectinidae.

David Jacobs (Univ. Calif., L.A.): Researching functional morphology and hydrodynamics of fossil cephalopods; continuing population studies of lottiid limpets.

George Kennedy (San Diego St. Univ.): Participating on San Diego Bay/Coronado Bridge retrofit project with California Division of Mines & Geology, which includes analysis of sediments for biostratigraphic data; continuing California Channel Islands Pleistocene marine terrace molluscan analysis.

Jim McLean (Nat. Hist. Mus. L.A. Co.): Continuing NE Pacific shelled gastropod book, treating 1200+ species (approximately 200 new species); will be updating gastropod section of *Lights Manual*; recently submitted manuscript on fissurellid gastropods of the genus *Fissurisepta* (with Daniel Geiger); continuing revision of worldwide Liotiinae (*Arene* and related genera).

Michele Nishiguchi (Univ. Calif., L.A.): Researching benthic (1-3 m depth) Hawaiian sepiid squid (genus *Euprymna*) that have bioluminescent bacteria (genus *Vibrio*) and has compared them to Mediterranean species that live deeper (40-200 m) than Hawaiian species.

Bill Rader (Santa Monica, CA): Conducted faunal survey, 1988-1994, of the Marina del Rey jetty, Los Angeles Co., that has yielded 74 molluscan species; continuing collecting Cretaceous, Paleocene, and Miocene mollusks of the Santa Monica Mountains.

LouElla Saul (Nat. Hist. Mus. L.A. Co.): Continuing research on Cretaceous mollusks (several projects with Richard Squires); compiling a California Cretaceous molluscan database.

Bill & Nancy Schneider (San Diego Shell Club): Collectors of late Pleistocene terrace mollusks near Mulegé, Baja California Sur, México.

Roger Seapy (Calif. St. Univ., Fullerton): Continuing research on heteropod systematics; Western Society of Malacologists President for 1999; currently organizing annual meeting at California State University, Fullerton.

Richard Squires (Calif. St. Univ., Northridge): Teaching paleontology; continuing research on Cretaceous and Paleogene mollusks of western North America; recently submitted manuscripts on nereniid gastropods and late Paleocene ("Meganos" Stage) mollusks of Simi Valley, Ventura Co.

Barbara Tan (Pacific Shell Club): No report

Mike Vendrasco (Univ. Calif., L.A.): Researching Late Cambrian-Ordovician chitons from the Great Basin area of Utah and southeastern Missouri; currently organizing California Paleontology Conference (Cal-Paleo) at UCLA.

Cecilia Williamson (San Diego): No report

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Vivienne Smith

The shell world has lost another friend. I have just learned that Vivienne Smith passed away today at her son's home in New Jersey. She was diagnosed with cancer last fall and has been on a steady decline since that time.

Vivienne was a long-time member of COA and served that organization in several capacities, pitching in many times behind the scenes. She was my dear friend and the last time I saw her was in November when she came to look over my *Epitonium* collection and help me with some identification.

Vivienne's sister, Irene Longley, has suggested that any memorial contributions should be made to the Bailey-Matthews Shell Museum, P. O. Box 1580, Sanibel Island, FL 33957.

—Barbara Elliott

Flowers to:

Kay Easland. All of the Conchologists of America mourn your loss. We shall miss Les terribly.

Our old friend and contributor, Bob Purtymun, who lost his beloved wife, Marian, on January 9, 1998 to cancer. We all send you a hug, Bob, along with your flowers. Kay Easland, Cal Goswellan and Mary Brady, we send loving bouquets to you too.

The Piech family in Delaware: COA member Alice Piech who has been battling illness and doing quite well; her husband, Ken Piech and COA's Tall One, Betty Jean Piech who are her support and cheering section; and another bouquet for Betty Jean, whose husband Frank has recently undergone more surgery. We have you in our thoughts daily.

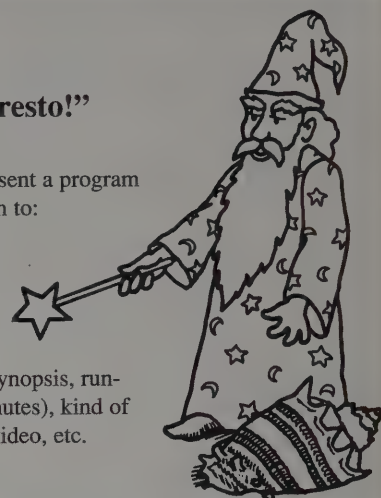
Don't forget the upcoming 2nd Australian National Shell Show, Sydney NSW, April 11-12. Exhibits, papers, awards dinner, hermit crab races, field trip, buy-swap-sell with 20+ dealers, all mingled with morning and afternoon teas. You are going to have a good time! Write Des Beechey 26 Malga Avenue, Roseville, NSW 2069, Australia, email at des@phm.gov.au, or phone 61 (2) 9417 4980

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Please indicate topic, brief synopsis, running time (ideally 20-25 minutes), kind of equipment needed - slides, video, etc.



Editorial Etiquette

Several newsletter editors have complained recently about proper accreditation of borrowed articles. Hardpressed volunteer newsletter editors sometimes make errors, and they deserve our understanding. But it is always a good idea to take note of the fact that when one publication reprints an article from another, it is both customary and expected that credit will be given to the author of the article and to the original publication. It is also important that the article be reprinted accurately. And it is not ever a bad idea to check with both the author and the original publication. Time consuming, yes, but also worthwhile in terms of saving later embarrassment or misunderstanding. (While you're at it, send them a copy of the finished publication containing their article as a thank-you.)

Did you know that...

Sea turtles worldwide are being afflicted by mysterious nonmalignant tumors called fibropapillomas. Growing both internally and externally, these tumors can smother the turtles of many species. Neither the cause nor a cure are known.

Zebra mussels are rapidly tenanting all our nation's lakes and waterways, smothering native Unionidae and jamming up outboard motors and water intake pipes. Imported from Europe in the ballast water of ships, about 10 years ago, these adaptable invaders are spreading so rapidly because they have no known enemies to keep their populations in check.

According to a recent Conch-L discussion/survey, the word *conch* is almost always pronounced *konk*, although dictionaries give *konch* as an alternate. It derives from the Greek *konkhe*, *konkhos*, pronounced with a hard *k* and meaning mussel or conch. The word made its way through Latin as *concha* and into French and Spanish. It may have reached English via the Spanish word *concha* pronounced *koncha*. This may explain the English spelling and perhaps the occasional soft pronunciation, "konch."

The latest number of *Xenophora*, *Bulletin of the French Association of Conchology*, (81), carries a heavily illustrated article by Emmanuel Guillot de Suiduiraut on new and little known marine gastropods from the Philippines, over half of them mitrids.



Cymatium armatum (Sowerby III): A "Lost" Species rediscovered?

By Russ Webb

Every year around the first of December, Sue and I look for a place to get away. By December, Portland, OR is a very wet place. Short days and overcast skies make it a good time to catalog specimens and eat holiday fare. There are only two ways for us to avoid getting that glow-in-the-dark, white look: sun lamps or a collecting trip to the South Pacific. So off we go, with sunscreen, bug repellent, Immodium AD and a few hundred pounds of scuba gear and cameras.

It has been getting harder and harder to select a destination. My interpretation of peaceful and Sue's concept of desolate seem to describe the same place. Sue likes to see other people, learn the customs, go shopping. If the only person living on the island is a dive guide, that's fine with me. Shell collecting, in itself is becoming more of a challenge. Not so much in finding shells but in finding a location that allows or at least ignores shell collectors. Fiji, at the time seemed to be the latter. Our requests for information on collecting there were met with silence or answers to questions that we didn't ask. We have found that this is usually a good sign.

The trip was long and bumpy. I was rewarded when the small plane coasted across a long stretch of coral, finding land only at the last moment. The Taveuni National Airport was what I had hoped for, although Sue was not so sure. A crowd of one met us with a rickety luggage cart. "You aren't by chance a dive guide?" I asked. "No." Well you can't have everything.

A half hour later and we were home, at least home for the next two weeks. The power was off, as it would be off much of the time. The island was a quiet place where people drove on the wrong side of the dirt road. Not that left or right is wrong, but down the middle certainly is. Especially if you are a tourist and don't know which side to drive on anyway.

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Fortunately the lodging included meals, for there were no restaurants. The first night we were served lobster. Pretty good for an all included meal. What we didn't realize was that they served lobster every night and by the end of two weeks some cow would have been greatly appreciated.

But we weren't there to eat; we could have done that at home. Before the end of the day we were snorkeling behind the hotel. It was pretty uneventful but still very nice. The next morning we were out on the dive boat. A short ride over glassy smooth water, and before we knew it we were among the most spectacular growths of soft coral that we had ever seen. We asked the dive operator if spearfishing was allowed, having noted that it was popular with the locals. Not intending, of course, to do any fishing, I have just found this to be a more tactful approach to shell collecting. If the guide swells up and gives me a lecture on buoyancy compensator operation then it is a forgone conclusion that shell collecting will probably be frowned on. In this case, the answer was just, "No," so we simply didn't ask about shells. In the end the dive guides didn't seem to care.

We had collected in the South Pacific a number of times before. Many of the shells we found were well known to us. We no longer collect most of these familiar species, looking instead for new additions to our collection. We are becoming shell snobs! The shallows around the island provided for some good snorkeling. We found *Conus omaria* and *pennaceus*, both about the same size and color but with unmistakably different structure. Also, a little deeper in the rubble, was *Conus terebra*. There were dozens of large *Conus marmoreus*, *virgo*, *litteratus* and *leopardus*, some of the last approaching 100mm. These were all in sandy areas with grass where the water was only four or five feet deep. There were *Strombus* and *Lambis* also in the grassy shallows but not in the same areas as the big cones. We moved from one beach to another. White sand, black sand, always something different to discover. Free diving to around 20', I collected a very fresh *Harpa harpa*, with such nice colors. The water was so very clear that it was possible to spot a *Strombus luhuanus* more than 20' down.

If the shelling was that good at 20' just think how much fun we could have at 100'! Well, for the most part, going deeper increased quality but reduced quantity. Most of our dives started out with a deep wall dive to 100' or more. Very nice, and we got some good pictures, but not too many shells. A 93mm *Conus vexillum* at 80' was nice but there was better collecting above 60'. Our second dive was usually shallower and much more productive.

I like *Bursa* and *Cymatium* ...never met a Ranellidae I didn't like...so I was quite happy here. The specimens we found were in unusually good condition. There were *Bursa rubeta* with brilliant red colors. Sue found a 61mm *Bursa lamarcki* in gem condition. We found *Cymatium pileare aquatile* and, on a night dive, *Cymatium rubeculum*. While I was happy to have these, the funny looking red triton we found was puzzling.

I found it (Is that right, Sue?), I found It, on top of some medium-sized rubble at 45' in an area with moderate current. Sue was off watching a 3' long titan trigger fish try to open a large cockle. At this point, although I was happy to have the other tritons we had collected, none of them were new to me. This one was. But I just stuffed it in a bag with the other soon-to-be stinky specimens for the long ride home.

We make notes of which shells we find, where and how deep in our dive log. The one labeled "Red Triton" was still a puzzle, even after all the others were cleaned and put away. I looked through all of our books, showed it to others in our club, even let them fondle it (like that is going to happen again!). No one knew what it was. So it sat for over a year. Every once in a while I would see a picture of a similar shell. "That's it!" But it never was. The real enigma was that it was so different in color and structure from any other *Cymatium* I had seen. And it was not a small shell at 61mm. It should have been easy to identify.

We have found rare shells before, *Trophon stuarti* locally, *Conus adamsoni* in the Cook Islands and others; but we had been looking for them. So all this time I suspected but refused to accept that this shell was a real find. It was actually more in the order of a real frustration. We have thousands of shells, all of them neatly organized, packaged and cataloged. But not this one!

I had sent in short articles to the *Hawaiian Shell News* before. Wes Thorsson was always kind and helpful. So I sent him some pictures of the mystery shell. He was sure he had seen it before but could not remember where. So it went into the December issue of the Net version of the HSN. Well, the results were a large pile of e-mail. *Cymatium armatum* was almost simultaneously identified by the experts. I can only thank those who helped and go dust off my shell.

Email messages to the Webbs after the shell was pictured on the online HSN included the following from Harry Lee, Bill Frank and Betty Jean Piech:

...I think you have actually come up with a discovery that has more impact on the shelling fraternity than a "mere" new species. The illustrated Triton is almost certainly *Cymatium (Ranularia) armatum* (Sowerby III, 1897). This comes as close to being a lost species as any large marine gastropod I can conjure up. I suspect this is the first live-taken specimen, the first specimen with specific locality data, and apparently only the seventh one ever taken....

—Harry G. Lee

...It is obviously a species that I don't have in my *Cymatium* collection which made identification easy — i.e., I had never seen it before. It is described in some detail in *Ranellidae and Personidae of the World* (Henning & Hemmen, 1993) on page 74 with a figure of the species on plate 17, no. 2. Also Sally Diana Kaicher has a picture of the holotype on her card 3293 (BMNH Type Collection) which is virtually identical to your specimen — although I must admit you apparently have an exceptionally intact and colorful specimen....

—Bill Frank

BOOK REVIEW:

R. Houart. 1997. *Les Muricidae d'Afrique occidentale. II. Ocenebrinae, Ergalataxinae, Tripterotyphinae, Typhinae, Trophoninae & Rapaninae*. Apex 12 (2-3): 49-91.

This is the conclusion of the much-needed review of the Muricidae of western Africa, which was begun in 1996 [see review in March, 1997]. That first part covered the Muricinae and the Muricopsinae. This part covers the remaining groups, which constitute quite a hodge-podge of species and forms. Note that Houart does not support the ideas of some contemporary workers that the "typhids" and "thaidis" represent independent families apart from the Muricidae.

Like the first installment, this is a well-illustrated and well-researched work. Houart gives us SEM photos of the radulae, line drawings of the protoconchs, and good photographs of the species, often showing several specimens to illustrate variation. As before, the text is in French and English, although the two are often not strict translations of each other, and the English version usually gets the shorter treatment.

Geographic coverage ranges from Morocco to Namibia, with special sections on Saint Helena and its endemic species, and the few Mediterranean taxa that spill out into the Atlantic. Thirty-three species and subspecies are recognized. This includes some extremely obscure taxa, such as *Ocenebra gruveli* (Dautzenberg, 1910) and *Jaton sine-spina* Vermeij & Houart, 1996, and one of the rarest shells known, *Pteropurpura sanctaehelenae* (Smith, 1891), known only from the holotype. It is refreshing that a survey such as this, of a fairly large

...Including the Webbs' new find...there are now 7+s specimens...In 1897, G. B. Sowerby III described and named this shell *Lotorium armatum* in the Proceedings of the *Malacological Society of London*, 2 (1896-1897):137-139, pl XI, fig. 1. The picture there is unquestionably the same as the shell from Fiji. It is the type and is currently in the British Museum. The shell was part of a donation by a Mr. Thomas of Brest. Unfortunately he neglected to preserve the records of the localities where the shells were found. A considerable proportion came from Tahiti and among the Marquesas Islands, so you will often see the locality listed as "Marquesas Is.?"

In 1933 the name was changed from *Lotorium* to *Cymatium*.

In 1975 W. O. Cernohorsky wrote [Auckland Institute]... "it has not been illustrated nor reported since the date of its description. The recent collect of 2 storm-tossed specimens from Pango Pt., Efate I., New Hebrides confirm the species occurrence in the Pacific." These are reported as being in private collections.

Manfred Parth wrote in *La Conchologia* May to June, 1988, that at that time only two other specimens were known: a juvenile from N. Queensland and a specimen of unknown origin, kept in the Academy of Natural Sciences in Philadelphia. I have had the opportunity to see and photograph the Academy's specimen, and it is truly a wonderful shell. Parth finished his brief article with the information that he had acquired an *armatum* specimen, but its locality data was dubious, or at least vague: "New Hebrides."

I also remember reading a few years ago that Thora Whitehead of Australia has one in her collection that she obtained from a diver but he wouldn't tell her the exact location....

And now from a location not previously reported we have the Webb specimen. That makes 7. So why did I say 7+? Well the Australian Museum in Sydney is reported to have a piece of one. If I ever get to Sydney, you can be sure I will look it up.

I am hoping in a year or two to have another trip to Fiji and I will look very hard, but since my maximum diving depth currently is about 3 feet, I am not very optimistic about finding a live one.

—The Tall One, Betty Jean Piech

group of species from a very large area, does not contain dozens of new species based on a wayward bump here or an extra band of color there. Houart describes no new species.

But there are some surprises. Perhaps his most interesting insight is the suggestion that three otherwise very different "species" actually represent subspecies of a single variable taxon. *Pteropurpura dearmatus* (Odhner, 1922), unknown to most collectors, now contains two more familiar names as subspecies - *benderskyi* Emerson & D'Attilio, 1979, and *fairiana* (Houart, 1979). The classic Brazilian typhid, *Typhis cleryi* (Petit, 1840), is synonymized with the Mauritanian *T. belcheri* Broderip, 1833, and recognized as yet another amphiatlantic species. In the thaidis, Houart separates *Thais callifera* (Lamarck, 1822) from *T. coronata* (Lamarck, 1816), which most workers had considered as subspecies, at best. The former occurs only in west Africa, while the latter is amphiatlantic (and includes *T. trinatatensis* Guppy, 1869, as a synonym).

This second installment is more straight-forward than the first, simply because the mind-numbing problems associated with groups such as *Hexaplex* and *Muricopsis* do not occur in the groups covered here. Any muricid collector worth his or her salt needs these reports. As specimens from west Africa become more and more accessible, everyone will eventually hold up that little non-descript shell and say "Is this *Muricopsis matildae* or *Morula consanguinea*?" Don't be caught in this embarrassing, yet easily remedied, situation. You know what to do.

The paper is available from the Société Belge de Malacologie; Ar. Mozart, 52; 1190 Bruxelles, Belgium.

The State Shells

Fourteen of the coastal states in the United States have designated an official state shell. They are as follows, with scientific and common names and dates designated:

Alabama: *Scaphella junonia johnstonae*, the Junonia, 1990; **Connecticut:** *Crassostrea virginica*, the Eastern American Oyster, 1989; **Florida:** *Pleuroploca gigantea*, the Florida Horse Conch, 1969; **Georgia:** *Busycon carica eliceans*, Kiener's Whelk, 1987; **Maryland:** *Ecphora quadricostata*, the Four-Ribbed Ecphora (fossil, now *E. gardenerae*), 1984; **Massachusetts:** *Neptunea lyrata decemcostata*, the New England Whelk, 1987; **Mississippi:** *Crassostrea virginica*, the Eastern American Oyster, 1974; **New Jersey:** *Busycon carica*, the Knobbed Whelk, 1995; **New York:** *Argopecten irradians irradians*, the Atlantic Bay Scallop, 1989; **North Carolina:** *Phalium granulatum*, the Scotch Bonnet, 1965; **Oregon:** *Fusitriton oregonensi*, the Oregon Triton, 1989; **Rhode Island:** *Mercenaria mercenaria*, the Northern Quahog, 1987; **South Carolina:** *Oliva sayana*, the Lettered Olive, 1984; **Texas:** *Busycon perversum pulleyi*, Pulley's Perverse Whelk, 1987.

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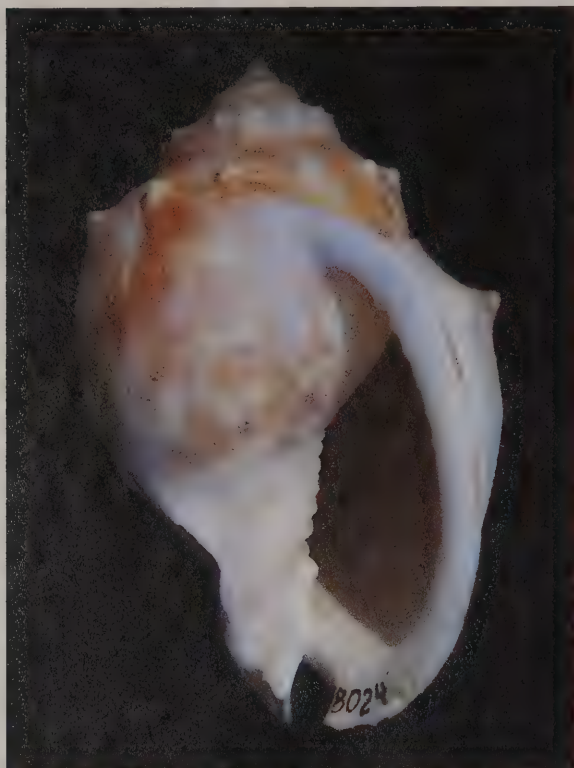
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Perhaps some collectors still remember this name, meaning "Beauties from the Sea"? I was its happy owner until 1988. Now retired in Florida, I would like to sell a portion of my world-wide shell collection, consisting of the most representative specimens of the Philippines, Australia, Japan, the Caribbean and Central America.

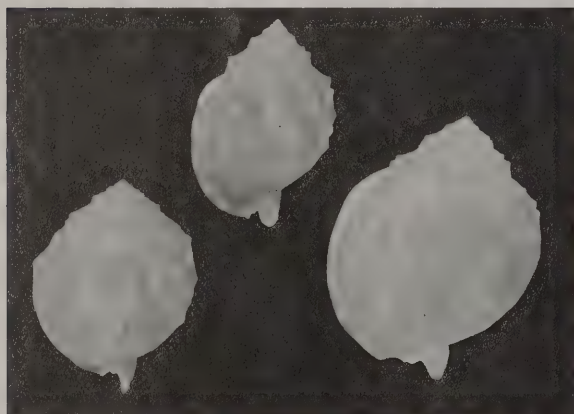
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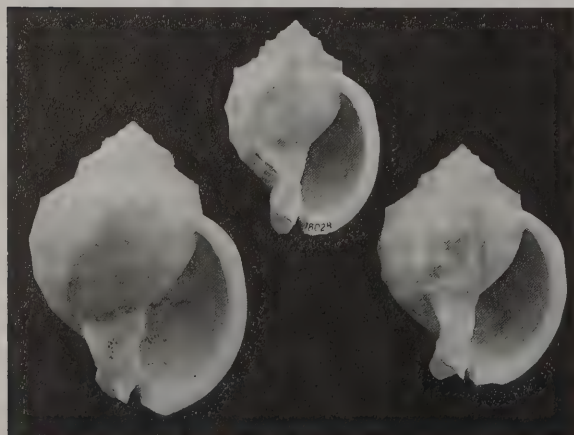
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Phalium pilsbryi showing columellar plications.



Phalium pilsbryi, dorsal view. Photos by Emilio García



Phalium pilsbryi, ventral view.

On *Phalium pilsbryi* (Woodring and Olsson, 1957), an interesting Panamic species.

By Emilio F. García and Lauretta Marr

When this species was first described, it was known only from the single type specimen collected in the Galapagos Islands; and eleven years later, when it appeared in *Indo-Pacific Mollusca*, no other specimens had yet been found. However, Carol Skoglund reports that the species has been trawled off Guayas Province, Ecuador, by shrimp boats; and in 1994 Y. Finet reported another Galapagan specimen in the collection of Gijs Kronenberg.

The species is related to the Caribbean species *P. coronadoi coronadoi* (Crosse, 1867) and, of course, its subspecies *P. c. wyvillei* (Watson, 1886). It differs from both, among other features, by having a heavier columella bearing strong spiral teeth. All three of the above taxa have been placed in *Phalium* (s.s.), *Phalium* (*Echinophoria*), *Galeodea* and *Bathygalea*.

The holotype is housed at the Academy of Natural Sciences in Philadelphia. However, Dr. Gary Rosenberg informs me that the specimen must have been dropped since Abbott (1968) illustrated it. He says that it has a small hole in the shoulder of the body whorl. This hole allowed him to see that the three visible columellar folds continue at least one whorl into the shell. He also informs us that the twelve short spiral columellar teeth that Abbott mentions do not continue past the aperture, but the spiral sculpture on the penultimate whorl does; that is, it does not get glazed over.

While visiting Mr. James Ernest, the well known Panamanian collector, the second author brought back three specimens of an unknown species of *Phalium* collected by Mr. Ernest. These are what seem to be *P. pilsbryi*, dredged off the southwest point of Isla Cebaco, Veraguas Province, southwest Panama, in about 200 meters of water. The measurements of the three Panamanian specimens are:

Length	Width	Height
70.5mm	46.5mm	41.0mm
76.7mm	57.0mm	46.6mm
92.3mm	67.3mm	57.6mm

The spiral teeth in the columella of our specimens number from 9 to 12, and the spiral sculpture is heavier than that of *P. coronadoi coronadoi*, *P. c. wyvillei* and the Galapagan *P. pilsbryi*. More importantly, the dorsal side of the lip is marked with five squarish, brown markings not mentioned in the original description. The color of the two best preserved specimens is a light tan with darker yellowish-tan axial bands. Both of these specimens become almost white about 2 centimeters before the formation of the flaring lip.

References:

- Abbott, R.T. 1968. The helmet shells of the world. *Indo-Pacific Mollusca*. Academy of Natural Sciences of Philadelphia. pp. 101-102
- Finet, Y. 1994. *The marine mollusks of the Galapagos Islands; a documented faunal list*. Museum d'Histoire Naturelle de Geneve. 180pp.
- Skoglund, Carol. 1992. Additions to the Panamic province gastropods (Mollusca) literature. *The Festivus*. Vol.25 (Supplement) p.47

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Coral bleaching, a disease in which the symbiotic organisms called Zooxanthellae leave the coral or die, is becoming a serious problem in the Florida Keys. The corals derive nutrients from these organisms; as well as much of their color; other animals use the colorful coral as hiding places. After bleaching, coral loses this food supply and fish and mollusks are highlighted against the white coral. Bleaching occurs when an increase in ocean temperature, or very calm waters, allow too much UV radiation to reach the coral. Iron-rich dust from the deserts of northern Africa may also be harming the corals of the Caribbean. According to federal geologists, it stimulates bacterial and algal growth which are harmful to the coral and may contribute to the bleaching.

SHELLERS - KNOW YOUR LIMITS!!!

By Carol Boswell Simpson*

I recently emailed subscribers of Conch-L regarding experiences with shelling accidents. What a cooperative group of people! I was bombarded with replies about hazards ranging from sharp oyster shells to eels, rays and fish spines. But no matter how painful the sea urchin spines or the jellyfish stings may be, no one mentioned the particular hazard of our own experience. And it is one that shellers would do well to think of.

Last May I led a group on a trip to Eleuthera, Bahamas: Connie and Fred Mersbach, Harold Brown, Betty Muirhead, Dianne Vining, and my husband Bob, all from our Palmetto Shell Club from Columbia S.C.; and Everett Long from North Carolina and Carole Marshall from Florida. Except for Bob losing a large chunk of skin on his shin from a wave knocking him onto rocks, the first shelling day passed successfully. Not exactly the jungles of Africa!

Tarpum Bay was our next destination. In one car, Connie and Fred and Bob and I had arranged to meet the others in our second vehicle, "somewhere along the road in Tarpum Bay." As sometimes happens with shellers hot on the trail of new shells, we didn't make our connection in Tarpum Bay. Couldn't find them anywhere.

After checking out the local dock, with a fresh load of *Strombus gigas* shells on it, and deciding we HAD to get away from the smell, we drove down to Cape Eleuthera, a pretty good area, I knew. But the road I remembered was obscured, probably by a hurricane, so we found a place that looked good and even had a picnic shelter, a deserted Navy seaplane ramp, we later learned. As we all know, ramps are slippery and bear watching!

As shellers do, we sort of went our four separate ways, (no more than 100 yards apart). I was a little north of the point when I heard Connie scream. As I turned toward the ramp where Connie was, I couldn't tell if she was laughing or crying. Flat on her back on the concrete ramp at the water's edge, she was holding onto Bob's leg, to keep him from falling too.

As we tried to get her up, we realized she couldn't stand. And the tide had turned, and was coming in. Fred, Bob and I just stood looking at each other, trying to figure out what could we do. It suddenly dawned on me that my brother had part interest in a condo near there — I had ridden past it once. So I went to find the condo and, hopefully, some help. (My husband told me later he doubted that I knew where I was going, or if I could find my way back.)

I found the group of condos, and the first car I saw parked there was one from Lake City, SC. I rang the bell — and nothing. I went on to the next condo, rang the bell and nothing. At the last condo, a Bahamian lady asked if she could help me. I said, "Yes, we have a friend who has fallen, and we need an ambulance." She said, "You can go find the dock mistress and she'll help you." By now, my mouth was so dry from fear, I couldn't have spit if I'd had to.

Behind the condos at the small dock, no dock mistress was in sight. However, a guy in a Zodiac across the canal was scrubbing the most gorgeous sail boat I've ever seen. So, I hollered as best I could that I needed help.

He said "One moment. I'll come over there," and of course, the motor on the Zodiac took forever to start. I told him about Connie, and the tide. He said he'd get help and pulled out his wonderful VHF radio. I returned to the boat ramp with the news that help was, hopefully, on the way.

About 10 minutes later, he, Michelle, French Canadian and Captain of the charter sailboat *Nervana*, arrived — with his trusty radio. He'd sent out the call that a woman was down, couldn't be moved and the tide was coming in, and he now was here, with his radio, for the duration.

*With the very able assistance of Connie, Fred and Bob.

121 Williams Way, Chapin, SC 29036 Email: Epitonium@aol.com



At Governor's Harbour, Eleuthera: l-r Carol Simpson, Dianne Vining, Connie Mersbach, Harold Brown, Fred Mersbach, Bob Simpson.

Photo by Betty Muirhead

Next came Marsha Skinner from Roseland, FL. with a blanket, blood pressure measuring devices, and a gangplank from the sail boat to be used as a stretcher. She had gone to nursing school for a year. The case holding her blood pressure devices couldn't be opened, so she ripped it apart. She gave great comfort to Connie.

The radio came on and we heard the ambulance on Eleuthera was in the shop having the air conditioning fixed. Someone called a taxi.

In about 10 minutes, another car arrived and out stepped a tall, lanky Texas doctor! (Who says prayers aren't answered?) He was Dr. Jack McCallum and he had heard the radio call while fishing, returned to shore, picked up his wife, and come to the rescue. Dr. McCallum checked Connie out, and said he thought her hip was broken. Connie was, naturally, in a great deal of pain. The tide was still rising.

We saw a dirt cloud rising from the access road: Oral Pender, a local taxi driver, with his station wagon taxi with the back seats down — our ambulance! Connie, in pain, was lifted onto the gangplank and put in the station wagon. If you've ever been to Eleuthera, you know how many pot holes the roads have. Each one was hell for Connie.

Dr. McCallum and Marsha rode in the taxi with Connie and Fred. Bob and I brought the other car and met them at the clinic in Rock Sound, where they had something for Connie's pain. The clinic charged \$40 and would only take cash. Dr. McCallum paid the \$40 and gave Fred \$160 more. But it turned out that Connie could not be treated in Eleuthera, and would have to be flown to Nassau by helicopter.

Bob and Fred returned to South Palmetto Shores, an hour's drive away, for their luggage, while we waited at the clinic for the helicopter, which was stuck in Nassau because of a thunderstorm. As we waited at the clinic, I asked Dr. McCallum, "What kind of doctor are you?" "A pediatric neurosurgeon." Well, it wasn't funny, but I guess shock had hit me too. All I could mumble was, "Thank God you're a doctor and you're here."

Meanwhile, the nurse was on the phone with Nassau and the helicopter. It turned out they wouldn't even take off without \$2644.70, cash or credit card. Among Fred, Bob and me, we had about \$30 with us, and credit cards are not a necessity in the "field." Enter Dr. McCallum again. He pulled out his Visa card, gave it to the nurse, and the helicopter was on its way. The storm had passed.

Bob and Fred, back at Rock Sound in record-breaking time, were loaded down with our gear. (To this day, I don't know how they packed so fast.) They drove on to the clinic, and we finally left for the airport. An eternity later, the helicopter finally arrived.

A lengthy discussion ensued as to whether Fred could go in the helicopter with Connie. There just didn't seem to be enough room for everything and everybody. The door to the helicopter was removed, but then another dilemma and lengthy conversation followed: how would the door return to Nassau? This was a MAJOR problem for the Airport Manager. He was promptly paid \$35 cash to send it back to Nassau. Meanwhile, back in the taxi, Connie was still waiting for treatment; but by now they had an IV hooked up, and she was better than she had been. She was taken to the helicopter, still lying on the gang plank, and as the helicopter took off, we could see Fred in the copilot's seat giving a thumbs up, and Connie's feet sticking out the door. This was at 6:30 p.m. — Connie had fallen at 11:15 a.m.

At Doctors Hospital in Nassau, they learned Connie could not be x-rayed until Fred came up with \$10,000 worth of credit — standard procedure. The x-rays showed that her hip was broken and she would have to be treated back in the United States. It was late so they had to spend the night at Doctors Hospital. Fred slept overnight in a chair. Cost for this one night — \$1,726.19, including x-rays.

Arrangements were made to fly Air Ambulance Professionals, Inc., in a Lear jet from Nassau to Columbia, SC. Fee: \$6550. Up front, of course. The hospital furnished the Mersbachs and the crew of the jet with sandwiches and soft drinks (\$55 worth), which was later confiscated by Customs in Ft. Lauderdale.

Connie and Fred returned to Columbia on Saturday night, after her accident on Friday morning. She immediately went to a 4-hour surgery, where a pin and cap with 4 screws were secured. Connie is making progress, albeit slowly.

Dr. McCallum would take no money for his services, although, of course, the helicopter charges were recovered from Fred's credit cards. Oral Pender wouldn't charge for his taxi, although he was reimbursed. The wonderful Dr. Jack McCallum paid the clinic charges, for which he was reimbursed. He ended up having to borrow \$20 from Fred to pay his taxi fare back home from the airport.

How beautifully strangers react to other strangers in need! It really has made us feel good to remember how kind and generous Dr. McCallum, Oral Pender, Marsha Skinner, Michelle, and others were with their time and efforts. However, our experience should also alert shellers who go to deserted places. If you have an accident away from cell phones, beepers, telephones, and computers, you won't get the response you get in this country — even though response time is sometimes slow — to us. And if you do get hurt in a foreign country (yes, the Bahamas is a foreign country) you'd better remember that they don't take Blue Cross.

The total cost of Connie's transportation home and one night's stay at the Nassau hospital was approximately \$11,000. So, shellers, be sure that you TAKE your credit cards, hope they've got plenty of credit left on them, and pray that you **won't** need them. They should be the #1 shelling "necessity" in a foreign country.

Note: Carol's account is adapted from an article published in the Jan-Feb and Mar-Apr issues of the Laddergram, newsletter of the Palmetto Shell Club. Carol is Editor of the Laddergram.

Know Your Pectinidae

by Betty Hunter

Betty Hunter, member of the Jacksonville Shell Club and Conchologists of America for many years, passed away Dec 3, 1996, mourned by her friends, former Latin students and fellow collectors everywhere. This is the last of Betty's shell quizzes. We'll miss her passion for shells and their names and for classical lore and language.

We wish to thank the Jacksonville Shell Club Shell-O-Gram and its Editor Bill Frank for allowing our readers to share the pleasure of her creations.

If pectens aren't your specialty and you find yourself needing a clue or two, check the box on page 21. Answers in the June issue. Answers to the Volute quiz from September are below.

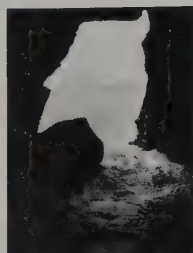
1. What species of pecten might easily go around in circles?
2. What species of pecten has the same name as Achilles' mother, a sea nymph?
3. What variable species of pecten is named after a Greek sea deity who could change his shape at will?
4. What species of pecten might need a dentist's services from time to time?
5. What species of pecten is the daughter of a royal couple?
6. What species of pecten might be considered odd, peculiar, or unfamiliar?
7. What species of pecten is directly related to the name of a respiratory ailment directly affecting newly born infants, especially those born prematurely?
8. What species of pecten shares the name of the Roman god of the forge?
9. What species of pecten is the spouse of the ruler of an empire?
10. What species of pecten might rival Julia Childs in the kitchen?
11. What species of pecten represents a single ring in a chain?
12. This species of pecten bears the name of a priestess of the Roman goddess of the hearth and home. Its reddish or saffron color suggests the red or saffron veil worn by these priestesses.
13. What species of pecten might seek the services of an orthopedist for the pain?
14. This species of pecten might be black and blue from bruises or become this color from rage.
15. What rare species of pecten appears to be enchanted or bewitched, a name perhaps related to the "Enchanted Islands" to which it is endemic? Darwin made these islands famous.
16. What species of pecten might easily win the hundred-yard dash?
17. What species of pecten sounds like the name of a marauder or pillager?
18. What species of pecten shares an epithet of Venus, the Roman goddess of love? The species name describes an island noted for its worship of Venus.
19. What species of pecten means "lovely, charming"? The name of the Muse of Lyric Poetry is derived from the name of this species.
20. What species of pecten could be a member of the U.S. Congress?

Answers to September's "Know Your Volutes" Quiz

- | | | |
|--|---|---|
| 1. <i>Tractolira sparta</i> Dall, 1896 | 6. <i>Cymbiolista hunteri</i> Iredale, 1931 | 14. <i>Adelomelon paradoxa</i> (Lahille, 1985) |
| 2. <i>Alcithoe swainsoni</i> Marwick, 1926 | 7. <i>Teramachia johnsoni</i> (Bartsch, 1942) | 15. <i>Livonia roadnightae</i> (McCoy, 1881) |
| 3. <i>Melo miltonis</i> (Griffith & Pidgeon, 1834) | 8. <i>Notovoluta gardneri</i> Darragh, 1983 | 16. <i>Arctomelon stearnsi</i> (Dall, 1872) |
| 4. <i>Alcithoe knoxi</i> Dell, 1956 | 9. <i>Scaphella dubia</i> (Broderip, 1827) | 17. <i>Cymbiolacca wisemani</i> (Brazier, 1870) |
| 5. <i>Cymbiola intruderii</i> Poppe, 1985 | 10. <i>Lyria nucleus</i> (Lamarck, 1811) | 18. <i>Teramachia tibiaeformis</i> Kuroda, 1931 |
| | 11. <i>Fusivoluta blazei</i> (Barnard, 1957) | 19. <i>Ericusa orca</i> Cotton, 1952 |
| | 12. <i>Lyria archeri</i> (Angas, 1865) | 20. <i>Paramoria guntheri weaveri</i> McMichael, 1961 |
| | 13. <i>Melo amphora</i> (Lightfoot, 1786) | |

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Did you know a Strutholariidae Society is aborning? There are just five species, all from the southern South Pacific. If you are fascinated by these "Ostrich Foot" snails, kin to the *Strombus*, and want to know more, email Des Beechy at <des@phm.gov.au> or write 26 Malga Ave., Roseville Chase, NSW 2069, AU

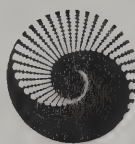
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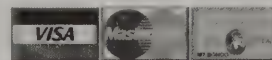
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Simnialena uniplicata (Sowerby, 1848)

by Philip L. Poland

Simnialena uniplicata, a common ovulid in the southeastern part of the United States, match in color the sea whips on which they live and feed.

Leptogorgia sea whips are slender branches of colorful tissue overlying a tough proteinaceous core. These coral-like colonial animals support a unique community of commensal and parasitic animals, *Simnialena* among them. Collectors sometimes find the whips, torn loose by storms, on Atlantic and Gulf shores, with *Simnialena* still attached. The snail can also be collected by snorkeling or diving rocky inlet areas where the *Leptogorgia* are likely to be established.

#30, 2741 Enterprise Road E., Clearwater, FL 33759-1151



The living specimens in these photos were collected during a low tide that was greatly enhanced by strong seaward winds. The exposed gorgonians would normally have been under about 1 meter of water during low tide. On this day they were readily visible from the road, as colorful plant-like structures on concrete debris along Gulf Coast passes. Most *Simnialena* on our coast are purple, as are the gorgonians. I tried to spot other colors of searods and found a number of yellow and a few orange forms. At Bunces Pass, just south of St. Petersburg, the unusual orange form of this beautiful snail was found along with typical purple and yellow specimens.

AMERICAN CONCHOLOGIST

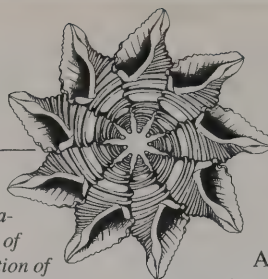
QUARTERLY JOURNAL OF THE CONCHOLOGISTS OF AMERICA, INC.

VOL. 26, NO. 2

JUNE 1998



CONCHOLOGISTS



OF AMERICA, INC.

VOL. 26 No. 2 JUNE 1998

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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MEMBERSHIP

Memberships are for the calendar year, January-December, late memberships retroactive to January. **1998 BASIC DUES:** \$20.00 (USA Bulk Mail). USA members wishing first class delivery add \$5.00. **Postal Surcharges:** Canada, and Mexico add \$5.00; other Western Hemisphere nations add \$10.00; Europe add \$12.00; Asia, Africa and Pacific Rim add \$15.00. Please pay in U.S. dollars, or on check with Transit Enrouting and Account Numbers printed at the bottom, or with money order; make checks payable to CONCHOLOGISTS OF AMERICA. **All Dues Payable To:** Lucille Green, MEMBERSHIP DIRECTOR. **BACK ISSUES** are available from PROPERTIES DIRECTOR Hank Foglino, 4 Trent Court, Smithtown, NY 11787-1266. Prior to 1985 \$3.00 each; 1985 to current \$5.00 each.

PRESIDENT'S MESSAGE

On Broadway, this column would be labeled the "Final Act." After two years as President of the Conchologists of America, I am now preparing to step down. At the close of this year's convention in Orlando, I will turn the Presidency over to someone else. It has been a wonderful experience and a time of happiness. Needless to say, it has also been a "labor of love" for the organization.

Being President is not an easy task in a social organization. It is hard and almost impossible to please everyone all the time. However, I have tried to make decisions that I felt would be the most beneficial to COA. The well being of the organization should always take precedence over any individual goal or ambition. I have always encouraged the COA Board and the COA membership to be good "team-players" and put the needs of COA first and foremost in their actions. I have tried to add these values to the office of President just as I have done in my professional life.

I would like to express my sincere appreciation to the membership of COA for the warm and caring support shown to me over the past two years. To all the COA Board members, "Thank You" for your indulgence, patience and support. Your cooperation and understanding has meant a great deal to me.

I am looking forward to a wonderful convention in Orlando this summer. I know Convention Chairperson Linda Koestel and all the members of the Central Florida Shell Club are busy preparing a "World-Class" extravaganza. For the golfers, you will be in Paradise, with six of the best golf courses in the United States at your fingertips. Bring all the kids and grand kids. Tour the Magic Kingdom, EPCOT Center, and all the other attractions in Central Florida. It should be a wonderful time for all.

In conclusion, "Thank You, COA" for two wonderful years as President. It has been a pleasure and an honor serving you. General Douglas MacArthur once said, "Old Soldiers Never Die, They Just Fade Away." Well, for me, I just move over and give someone else the honor of guiding the organization. I sincerely hope you will show the same care and cooperation to the next President, just as you have to me. I look forward to seeing each of you in Orlando in July. Please come and "Discover the Magic".

Dave Green



THINGS TO DO IN A HURRY!

- ✓ Register for the 1998 Walt Disney World COA Convention right away! (Find that aqua reservation form!)
- ✓ Send donations for the Auction to Dave and Lucille Green.
- ✓ Sign up for field trips: World of Orchids, Renninger's Antique Show, Cypress Gardens, Sleuths Mystery Dinner Theater, and the SCUBA trip.
- ✓ Decide whether to eat Sirloin of Beef Madagascar, Chicken "Royale" or Atlantic Salmon at the Banquet!
- ✓ Make reservations for July 19-23 at the Royal Plaza Hotel. (Phones: 407-828-2828, 800-248-7890)
- ✓ Make travel arrangements immediately!

COVER: Watercolorist Leigh Murphy (Jacksonville Shell Club) says of her work: "The medium of watercolor is exhilarating in its ability to produce rich brilliant color, its capacity for incredibly fine detail and varied textures. I enjoy the challenge of depicting difficult shapes, light effects, and textures." She has met that challenge beautifully in the painting which adorns our Summer cover. An award-winning artist, Leigh has chosen shells as the subject for many of her paintings. She can be reached at 1536 Ingleside Avenue, Jacksonville, FL 32205. Phone: (904)387-0619.



Charles Edward Glass

1934-1998

by Lynn Scheu

FIELD MUSEUM LIBRARY

To live well, to have one's work be one's greatest pleasure, and to die in the midst of doing the things one loves is perhaps the greatest gift we can hope for of life, and it is one that comes to few of us. But it came to Charles Edward Glass. On March 23, 1998, the worldwide shelling fraternity lost Charlie Glass to a sudden and quite unexpected heart attack at his home in San Miguel de Allende, Guanajuato, Mexico. Although he had retired from shell collecting in 1991, Charlie had long been known, both in the U.S. and abroad, as one half of the Abbey Specimen Shells duo (with Bob Foster) in Santa Barbara, California, providing fine shells for all our collections. He was also a *Murex* aficionado (or "amateur," as he would have it, in the original sense of the word), a motive spirit in shell collecting on the West Coast, and, for four years, the editor of this journal.

Born May 24, 1934 in New York City to a family immersed in the arts, Charlie grew up in Spring Lake, New Jersey. His father, Beaumont Glass, was first violinist with the Philadelphia Orchestra and his home was a haven for writers, artists and musicians. His mother, Lillian Krauss Glass, was an opera singer and his sister Virginia was a sculptress. His older brother Beaumont Glass Jr. was director of Musical Studies at the Zurich Opera and then Director of Opera Theater at the University of Iowa.

Into such an arts-impassioned environment was born an ardent naturalist. Charlie's first love and last love was cactus and succulents. (We have always supposed he came to shells through those spines on *murex*!) In childhood he adored gardening and was already attracted to cactus and succulents in his family garden. His other early interests were predictable, given his family background. He went to Phillips Exeter Academy in New Hampshire, then the Sorbonne to study French, then Yale from 1952-1953. But he was unhappy there and joined the Army in 1953 as a radio operator in Germany.

Back in the U.S. in 1956 Charlie studied acting, doing summer stock set construction and repertory acting. Then it was on to Santa Barbara for his brother's wedding and the Music Academy of the West where Charlie performed in *Der Rosenkavalier* with Lotte Lehmann. He returned to New York in 1957 and began work at Columbia University. Soon he took a few courses for pleasure, and eventually wound up with a degree — in acting and language. (Charlie was proficient in English, Latin, French, German, Italian, Russian, and the Philippine national dialect, Tagalog.) Then back to California he went.

Purchasing some 30 cacti from Sears and thinking he had virtually a complete collection, Charlie, who intended all along to return to New York, settled in there in Southern California for a time to watch them grow. Before long he was learning scientific names, lecturing at the local succulent society meetings, and buying a dilapidated cactus nursery in the San Fernando Valley which he named "The Cactus Shop" and opened on April Fool's Day, 1962. He also wanted to sell books; he eventually bought the Abbey Garden Press (by the end of 1964) and became the editor of the *Cactus and Succulent Journal*.

One morning in December, 1963, when Charlie opened The Cactus Shop, he found a man wandering around the shop. The intruder explained that he had given up trying to find the shop open and, that morning, he had hopped the fence to have a look around. He expressed a great need to meet a cactus collector near his own age, and Charlie, ever the enthusiast, liked him immediately, closed up shop and took the intruder, Bob Foster, to meet all his cactus cronies. Five years later the two men entered a partnership that encompassed cactus, the *Journal* and, eventually, shells.

During the next five years, Charlie and Bob ran their cactus busi-

ness, produced the *Journal*, and explored Mexico for cactus and succulents, discovering a number of new species. Charlie and Bob are acknowledged experts in the field, with many books and articles on the subject to their credit. Charlie's 1991 book, *Cacti*, (with Clive Innes of Holly Gate Nursery in England) is THE pictorial encyclopedia of cactus. Charlie described 27 species of cactus, most of them in company with Bob, and did taxonomic revisions on 26 others. They felt incredibly fortunate to be living the life they led. It all seemed like a hobby, doing the work they loved and getting paid for it!

In 1973, the two moved to Santa Barbara where they became co-directors and landscape architects for the 37-acre botanical garden of Lotusland, the private creation of the Polish opera singer Mme. Ganna Walska. Here Charlie remained until Mme's death in late 1983. Bob had departed Lotusland in 1975 to oversee their Abbey Garden property and to manage the cactus nursery, but soon they were also getting into the shell business. It was Bob who was the shell collector. "Charlie," Bob says, "got interested in shells because I did. Since we were business partners operating out of his residence I kept my small collection in my office rather than at home, and then he began to get interested. And of course when he realized that travel could be involved, he got very much more involved. He was always ready to travel anywhere, anytime, at the drop of a hat."

By late 1980 they were buying stock and establishing their shell business. They issued their first list for Abbey Specimen Shells in January, 1981, and by that summer the business was so successful that Bob went into it full time. The rest is history. The Abbey Specimen Shells became one of the leaders in its field. With Bob as Managing Editor, Charlie also edited *The C.O.A. Bulletin* from mid-1982 until his resignation at the end of 1986. As editor of the *COA Bulletin*, Charlie reached many people in those four years, communicating his own enthusiasm and exposing many collectors to a richer world of shell collecting than they had known before.

Charlie's other passions...music, languages, photography, scuba diving and swimming, and travel...combined well with life as a shell dealer. He traveled to many countries, 19 times to his favorite place, the Philippines. He loved the Philippine people. Ever the linguist, he taught himself the Philippine Tagalog and Visayan languages. He translated and memorized 300 Philippine native songs and sang with well-known Philippine entertainers and on Philippine (and Los Angeles) TV. He also made 750 scuba dives, spending 450 hours underwater, all over the world.

In 1991, Charlie traded in his Philippine songs for Spanish ones, and his shells for cactus heaven when he decided to make the last great move of his life. Bob was getting married, and while Charlie was contemplating his move from their shared house to another house across town, he thought, "Why do this? If I am moving, let's make it count!" And so he took his dream job in San Miguel de Allende, in central Mexico.

Here he became curator of cacti and succulents and of the herbarium at the botanic garden, El Charco del Ingenio. He loved it. It was his dream come true, landscaping, growing cactus, hunting cactus, studying cactus, all in the "home of the cactus." He loved the Mexican people as he had loved the Filipinos, immersing himself in their everyday lives and their culture. When he visited Havana, Cuba attending the 5th Congreso de Botanico Latino-Americano, he received one of his highest accolades: he was elected an honorary Latino-Americano. He said to this author, in his Christmas letter in late 1995, "Yes, Lynn! I am still enjoying my life down here, perhaps more than ever! It's challenging, incredibly rewarding...and oh, such wonderful people! I've never felt more at home in my life!....It's as if the first 56 years of my life were preparation to be able to fully appreciate these last 5!"

Another time, in another letter, he rhapsodized on his life in Mexico. "I suppose mostly it's just where I belong. Values of my friends and coworkers are closer to mine. I love the antiquity of the

place...my city is about to have its 450th anniversary and as my former boss, Mme. Walska, put it, 'I like rocks with time on them.'... everywhere I turn my eyes pleasure me: the cobbled or slated streets, the burros led through town, the huge carved doors, the people — ah! the people!...and of course my work! ...The other day a friend of mine found a remarkable new species AND an even more incredible new genus growing together and took me there the next day, wanting me to describe them! What else? I LOVE the local mescal! The best I've ever tasted. There's not one person I work with whom I don't like...I could go on and on!" And he did!

And far from stagnating with all this pleasure in his life, Charlie continued to grow. In January, 1995 Charlie wrote to the author about his growing conservationist feelings and his activism:

"Interesting, the situation with the law and collecting. We cactus people got into it about 10 to 15 years earlier than you shell people. That's one of the reasons I left cactus and took up shells; I got tired of being a virtual criminal if I wanted to publish a Mexican taxon...and I got tired of being the one always asked to speak against the conservation laws...sort of like being the spokesman against motherhood and apple-pie! I was always opposed to the laws, but now find myself a bit on the other side of the fence, saying, hey! You wanted the laws, I didn't, but now we've got them and therefore we have to respect them...I recently created a frenzied furor in the cactus world



Charlie Glass and Bob Foster, as pictured on the November-December, 1990 cover of *Cactus and Succulent Journal* 62(6). This caricature, a tribute to the duo for their work on cactus, is the work of South African artist Gerhard Marx, another cactus fancier, and portrays Charlie and Bob in their natural element.

by proposing that editors of magazines publishing new taxa published outside their country should request that the description be accompanied with the number of the legal permit under which the specimens were collected: the presidents of virtually every major cactus society have written to denounce my heretic position as well as directors of botanic gardens specializing in cacti, accusing me of everything from destroying the rainforests in Brazil to supporting Apartheid! (Martin Luther King said it is the highest morality to oppose unjust laws...I responded yes, he and Ghandi and Socrates were ready to go to jail or die for their beliefs, but I don't see any scientists ready to go to jail for their right to take plants out of Mexico!")

Charlie died in the midst of his life, healthy and enthusiastic, hard at work and full of conviction, right up til his date with the heart attack that took him. We should all be so lucky! And as for this bereaved friend, I am just going to pretend he is still down there in Mexico cultivating his gritty garden,

growing all things spiny! I'll get by to visit him one of these days.

Much of the information for this article came from a biography on Charlie, written a few years ago, by Larry Mitich, Department of Botany, University of California, Davis for *The Cactus and Succulent Journal* (U.S.), Vol. 65, p. 3-11.

A PANAMANIAN ADVENTURE

by Emilio F. García

When James Ernest, the well-known Panamanian collector and dealer, invited me to visit him, I never expected it was going to be such an unforgettable journey. This was not going to be my trip but his trip. We were going to go to the places he wanted, when he wanted, for as long as he wanted. I was there for the ride, and I totally loved it!

The other guest in the expedition, Laretta Marr, from Midland, Texas, had gone a few days ahead of me to help him with the trip; so by the time I arrived in Panama City in early January, she and Jimmy had taken care of everything. Well, almost. We did have to go early the next morning to a special market where they sell fresh produce and where, instead of stalls, they have trucks that come from all parts of Panama with plantains (cooking bananas), avocados, pineapples, oranges, papayas, and everything else you can imagine; you buy what you want directly from the trucks. And Jimmy bought, and bought.

You should have seen his pickup truck the next morning, when we

finally left on the three and a half hour ride to Puerto Mutis, a quaint little port that seemed unreasonably to be in the wrong country. It should have been by the shores of the Amazon River. Two things stick in my mind about that truck as we left Jimmy's house: it was piled up four feet high, and it had gallons and gallons of water covering everything. Jimmy would eventually use the empty gallon containers to pack his shells.

In Puerto Mutis was Jimmy's indestructible dredging boat, *Titi*, and its indefatigable crew, Rafael and Efraín, waiting impatiently for us. As they began to load the boat in that beautiful late afternoon, I was transported to other exotic countries and other experiences. The port is by the forested shores of a beautiful, wide river, and two hours by boat from the ocean; but even there the forces of the immense Pacific tides could be felt, and the water was brackish, making it possible to find such species as *Stramonita kioskiformis* (Duclos, 1832) and *Littorina fasciata* Gray, 1839 on the pilings of the pier. It would take four hours for us to reach Gobernadora Island, a pretty, forested, scantily populated island where Jimmy has his camp.

The next morning we departed for one of Jimmy's favorite collect-

ing areas, Arenas de Quebro, at the southeast end of Montijo Bay, southwest Panama. It was another three and a half hours to Arenas de Quebro, but the weather was great, the benches had cushions and we were eager, so it all worked out. By now we were eight. Another crew member, Hernan, and two young boys, the sons of Rafael and Efraín, had joined us.

You can dredge in Arenas de Quebro all you want, but it takes all the expertise of Jimmy's crew to find "the right spot"; and the right spot was where one could find *Trigonostoma milleri* Burch, 1949, *Prunum woodbridgei* (Hertlein, 1951) and *Persicula imbricata* Hinds, 1844, Jimmy's favorites. It did not take us long to realize why Jimmy had brought the young boys along. They had the eyesight of eagles, and so did their parents. Laretta and I didn't have a chance with them when it came to finding shells in the dredged material. At times we did not even see them pick up shells, and saw them only later when they showed up in Jimmy's hands. At other times they would play with us, kidding us when there was a *Trigonostoma milleri* or some other good species in front of us, and Laretta and I tried desperately to find it. And you ask yourselves, how can that happen? Such a distinct species as *T. milleri* twelve inches from your eyes and you can't find it? Well, my friends, this experience certainly did not do anything to improve our egos as shell collectors.



Clockwise from upper left: The 25.5mm *Persicula tessellata*; *Niso excolpa*; *Perpicaria clarki*; *Pyramidella linearum*; two color forms of *Oliva spicata* which were dredged at Arenas de Quebro, SW Panama. Note the variability in animal coloration.



Phos cf. turritus,
18.5 mm, from
Arenas de
Quebro.

Soon we developed a routine: we would wake up around seven, or whenever Jimmy did his rooster crowing emulation, put all the sleeping gear away, go to shore to "Sing the National Anthem" (This was Jimmy's euphemistic phrase for doing something about the byproducts of metabolism), come back to the boat, and eat whatever our consummate Chef Efraín had for us for breakfast. We were usually dredging by 8:30 a.m., would stop for a quick lunch of whatever (who cared?) around 12:30, and then dredge again until sunset. Then we would go to some marvelous, quiet bay, with tropical forest down to the shoreline, surrounded by pelicans, seagulls and jumping fish, and relax until supper. Later on we would see huge dolphins and even whales. Bathing? Well, it is not a lot of fun to bathe in the ocean and then dry up with all that salt sticking to your body, so we would wait until we found a stream or water falls and bathe there. I think it was three times for me. We all smelled the same so we could not tell the difference. Lauretta, always prepared, did bring some baby wipes which helped a lot from one bath to the next.

Titi is a very comfortable boat. It is roofed and has a bench on either side with cushions on top. However, at night, with eight people on board and no one on deck, and a huge icebox in the middle of the boat, there isn't a lot of room to maneuver. The crew would play dominoes on top of the icebox, illuminated by the light of Coleman lantern; Jimmy would usually go to sleep; and Lauretta and I would read. And when the light went off, at least Lauretta and I hoped that there would be no National Anthem to sing that night, because the accommodations were, on one side, head to toe, head to toe, head to toe; idem for the other side, and Rafael and his son on the floor! Well, a little inconvenience is good for the soul and, at times, a superb testing tool for your willpower.

We spent 5 days dredging in the muddy bottom of Arenas de Quebro and collected 130 gastropod species belonging to 31 families. The best represented were Turridae, with 23 species; Terebridae, with 14 species; Olividae, with 9 species; Cancellariidae, Columbelloidae and Mitridae, with 7 species each; Nassariidae, with 6 species; and Epitoniidae, Muricidae and Naticidae, with 5 species each. Among the most interesting findings were a *Nitidiscala gradata* (Sow., 1844) measuring 39.2 mm, just a couple of millimeters short of the published world record; *Pyramidella linearum* Pilsbry and Lowe, 1932, whose known southernmost locality was Acapulco, Mexico; *Niso excolpa* Bartsch, 1917, a much rarer species than *Trigonostoma milleri* or *Niso splendidula* (Sow., 1834); *Perplicaria clarki* M. Smith, 1947, a very rare species one would never guess belonged to the Cancellariidae; *Subcancilla funiculata* (Reeve, 1844), a misunderstood species not synonymous with *S. sulcata*; and a black *Phos* sp. which is close to A. Adams' taxon *turritus*. As far as bivalves are concerned we found 27 species representing 14 families.

All of the above were found in an area no larger than about one square block. Whenever we explored other areas, the dredge hauls were disappointing, except for one day, when we tried a spot south of Arenas, with very hard bottom. The dredge would come up almost empty, except for very large *Persicula tessellata* (Lamarck, 1832). Skoglund (1992) lists the largest specimen of this species as 18.4 mm,

but I am sure some of us have specimens somewhat larger. However, the average specimens from that area were around 22 mm, and 24 mm specimens were not rare. My largest specimen measures 25.5 mm.

After those wonderful days in Arenas we returned to Gobernadora to take care of the shells and get more provisions. Then we left for another one of Jimmy's favorite spots, Islas Secas, in the Golfo de Chiriquí. These remote islands are not easily accessible, and it took us two days to get there. The first day, a three and a half hour boat ride to a bay on the Chiriquí coast called Manglarillo, and the second day a similar offshore trip to Secas.

Ah!, Manglarillo. Imagine a secluded bay enclosed by walls of lush vegetation with placid, inviting waters. Perhaps I had been in the tropical sun too long but, for me, it could not have gotten any better. If it only had monkeys, to add another touch of exoticism. Well, it did. They were howling monkeys and, at Quebro, playing the role of roosters, they would wake us up on early mornings, but we would never see them. Here in Manglarillo they were right there, in all their splendor, for everyone to see. What can I say?

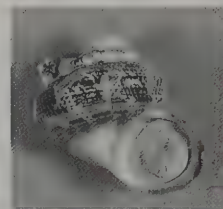
Well, I can say that we did some dredgings around the area and it wasn't bad; no sir, not bad at all. It was very hard bottom so the dredge came up very clean; nevertheless we collected 43 species belonging to 15 families and including seven species of cones; *bartschi*, *lucidus*, *orion* and *vittatus*, among others. We also collected *Thala solitaria* (C.B. Adams, 1852) and a drilled, but large, *Hirtoscala replicata* (Sow., 1844). The most interesting species for me, however, was a dead specimen of *Hemitoma hermosa* Lowe, 1935. The southern limit for this species was listed by Keen as Banderas Bay, Mexico, so this record places this species quite a bit farther south.

The experience in Islas Secas was similar to that of Arenas de Quebro. Jimmy's main interest was to collect the very beautiful *Niso splendidula*, just as in Arenas it was to collect *Trigonostoma milleri*; and, as in Quebro, the rich collecting area was very limited. Finding it would have been an impossible feat had it not been for the experienced crew. The "right spot" had a very strong current, and the bottom was literally covered with the huge bivalves *Pinctada mazatlanica* (Hanley, 1856) and *Hyotissa hyotis* (L., 1758) (= *Ostrea fischeri* Dall, 1914). If those species did not come up in the dredge haul, the haul was no good.

We dredged in Secas for four days and collected 73 species of gastropods representing 34 families. This time the muricids were the most numerous, with 11 taxa. Among the most interesting species were a *Columbella* sp., *Cirsotrema togatum* (Hertlein, 1951), *Turbo mazatlanicus* Pilsbry and Lowe, 1932, and a fourth species yet to be identified, even by family. Twenty-four species of bivalves were collected in the area, coincidentally representing 14 families, as in Quebro.

On the way back to Gobernadora we dredged in a few more places near the coast. One exciting find was a large miter with a very dark periostracum dredged in 120 ft. at Canal de Tierra, Gulf of Chiriquí. With the commotion of the moment, at first I took for a *Prunum woodbridgei* Hinds, 1843, but on close inspection it showed quite a different sculpture pattern.

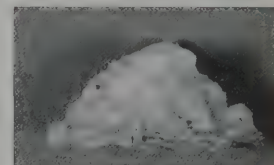
Lauretta would stay for another week to take advantage of the extra low tides. But time was up for me, and I had to go back home. Why is it always that way? Always too soon.



Turbo mazatlanicus,
12 mm, Secas.



Nitidiscala gradata 39.2 mm, a
near record
specimen from
Arenas de
Quebro



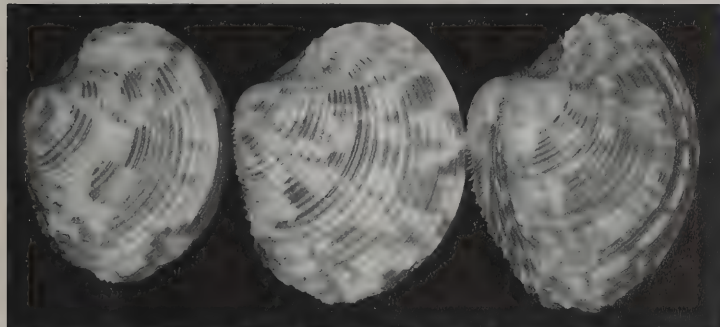
Hemitoma hermosa, 17.2
mm. A dead-collected
specimen from
Manglarillo

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THE BRAZILIAN CONNECTION: Let's Go Shelling in Brasil – Part 1

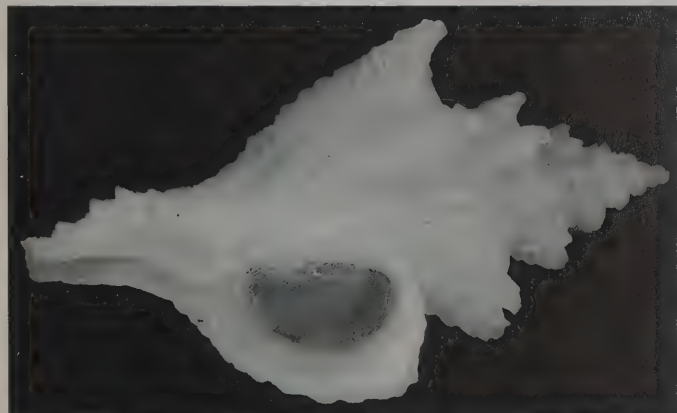
by José Coltro



Chione pubera (Bory Saint-Vincent, 1827). 65-68 mm, from Cabo Frio.

People frequently ask me, "How is shelling in Brasil?" First of all, the Brazilian fauna is really restricted if you compare with the Indo-Pacific or the Caribbean areas. The Atlantic here is the youngest ocean on earth and the mollusks are limited in number of species.

The Brazilian coast starts (or finishes) in Chui, in the extreme south, in the State of Rio Grande at the border with Uruguay. From Chui to Rio Grande City, the coast has a very long flat beach where it is possible to find some Magellanic and Patagonic species, like *Olivancillaria carcellesi* Klappenbach, 1965, *Olivancillaria contorduplicata* (Reeve, 1850), *Olivancillaria auricularia* (Lamarck, 1810), large *Amiantis purpuratus* (Lamarck, 1818), etc. Species are few in number here, but specimens of each species are abundant.



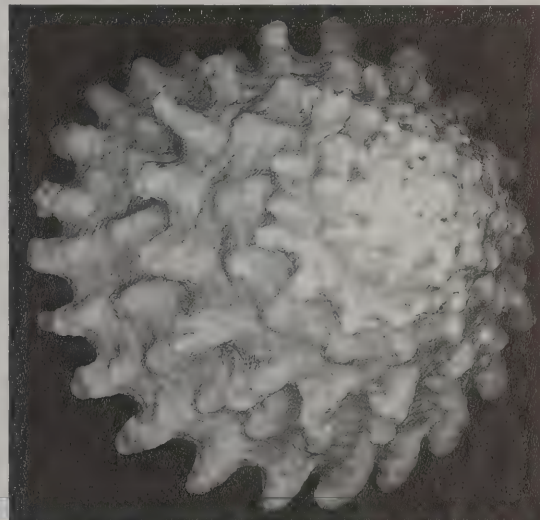
Trophon pelseneeri E.A. Smith, 1915. 32 mm, dredged off Rio Grande.

Crossing the mouth of the Lagoa dos Patos (Lake of the Ducks), starts the longest Brazilian beach — for hundreds of miles a very wild and deserted flat beach with a strong and rough sea. Few shells are found and it is a very rigorous adventure to explore this part of the country. The long beach ends in a rocky formation called Torres, the end of canyons that start in the center of the state. After this formation the coast of the State of Santa Catarina begins. It is a very nice part of the Brazilian coast, full of bays, islands and white sand beaches. Here the fauna becomes more tropical and in fine spots to dive, it is possible to find species like *Chicoreus senegalensis* (Gmelin, 1790), *Calliostoma adpersum* (Philippi, 1851) or large *Cymatium parthenopeum* (von Salis, 1793). The sea here is very clear, but clear doesn't mean warm! This part of the country has a very strong German influence and it is easy to notice that in the people, architecture and

hospitality. Most of the coast has an extremely good tourism support and it is really easy to find good places for shells.

Our coastline continues with nice bays and islands for the next Brazilian state, Paraná. This state has a very short coast, but in the northern part there begins one of the most important ecosystems of South America. It is the Ilha do Cardoso complex. Between Parana and the State of São Paulo, there is one of the wildest mangrove areas of our coast. It is the nursery for thousands of species and it is the most protected State Park of Brasil. Nobody may visit this area without special permission. The area is rich in islands and the natural Atlantic forest is so preserved that recently some biologists found a new species of monkey. Mollusks like *Olivancillaria vesica* (Gmelin, 1791), *Tellina punicea* Born, 1778, *Sanguinolaria cruenta* Lightfoot, 1786) and many

other bivalves are easily found. This complex extends for about 150 miles north and beyond it stretches a very long, flat beach all the way to the city of São Vicente — the oldest Brazilian city, founded in 1532.



Astraea tecta olfersii (Philippi, 1846). 46 mm, from Ilhabela.

Here there is another

mangrove complex with very large islands and the most important Brazilian port: Santos. It was here in Santos that my brother Marcus and I started to collect shells in our childhood. The Santos Bay was really rich in mollusks and we found there more than 100 different species, common sand beach species and some collected on the rocks. We found species from Patagonia and Caribbean species there. Today, pollution and a very large population have destroyed most of the local species. Santos has a million people but in the summer time or holidays the city receives another 2 million tourists from São Paulo City, just 45 miles from there. During the 60's and 70's Marcus and I found species like *Hasula cinerea* (Born, 1778), *Tegula viridula* (Gmelin, 1791), *Natica limbata* Orbigny, 1840, etc. It was a great time.



Boraceia Beach, São Paulo State.

Outside Santos Bay, there is the large island of Santo Amaro and one of the most exclusive beach cities of Brasil: Guarujá. With a sophisticated tourism and very nice beaches, it is the beginning of the most beautiful part of the Brazilian Coast — the Green Coast. For the next 500 miles, the coast is wonderful, full of bays, islands and many wild places. Some of the best spots to dive will be found here. Just past Guarujá appears a very nice series of long beaches, hidden bays and small islands covered with tropical forest. Places like Boraceia, Maresias, Juquei and finally São Sebastião City and Island are some of the best places to collect shells — as I already described in a previous article. Shells like *Cypraea zebra* L., 1758, *Oliva circinata tostesii* Petuch, 1987, *Trophon pelseneeri* E.A. Smith, 1915 and *Muricopsis marcusii* E. Vokes, 1993 are found.

North of São Sebastião Island, the Green Coast is even greener, and wild. On the way north there are many wild bays with white sand beaches lined with forests. Just crossing the boundary between the State of São Paulo into State of Rio de Janeiro, there is Parati, one of the most beautiful colonial towns of Brasil, and just there is found the Ilha Grande Bay. This is one of the most fantastic places in the entire coast: a hundred islands of all sizes, from tiny islets to the very large Grande Island, in a very calm and translucent sea. It is one of the best spots to find *Nodipecten nodosus* (L., 1758) and large *Cypraea zebra*. All along this area one can find some really good hotels with diving services. Grande Island is

a special world: there are no cars, roads, and cities — it is almost completely wild, full of mountains, tropical forest, clear rivers with many waterfalls. Only fishermen live there, and a very few tourists. On the island stands a very old, abandoned maximum security prison. The island has an endemic and non-studied land and fresh water fauna. With about 300 square kilometers it is one of the best places for people who like adventures.

Driving a sinuous road, we reach the very nice city of Rio de Janeiro, which offers some of the best beaches and natural scenic views. Most of the beaches have a rough sea and very few shells will be found there. But the city deserves to be explored. Just across the bridge between Rio and Niterói begins the lake region, called this because of some salt-water lagoons. The largest is the Araruama Lagoon. The beaches of this area are long and very flat. Ending this region is Cabo Frio (Cold Cape) — in my personal opinion the most beautiful part of the Brazilian coast. The sea is a wonderful deep blue, with large islands and white sand beach. The water is really cold because of a phenomenon called resurgence which brings rich and frigid waters up from the depths; this vertical cold-water current

appears very close to the coast. The specimens are huge. Here one can find *Cypraea zebra* over 120 mm or *Nodipecten nodosus* over 160 mm! The flora here is quite different — it is one of the driest areas on the Brazilian coastline, and most of the hills and islands are covered with bushes and cactus. It is a nice sunny day almost the entire year. But when the rain starts, it is possible to find many land shells in the genus *Thaumastus* and *Megalobulimus* walking around. Very close to Cabo Frio is a small and very charming town called Buzios. For many years, Marcus and I collected some good material there. We found many species of *Olivella*, *Morum oniscus* (L., 1767), *Naica*, etc. Here our friend Lauro Barcellos, from the Museum of Rio Grande found a 133 mm *Cypraea zebra* — we found one of 127 mm.

The scenic view north of Rio de Janeiro State is changing to one of the most interesting areas — it is the delta of Paraíba do Sul River. It is

a flat area full of lakes and mangroves. There are many fishermen around and they normally get some great shells, including the very rare *Odontocymbiola saotomensis* Calvo & Coltro, 1997.

As we cross into the state of Espírito Santo, the coast changes to a mountain area. Large mountains and cliffs are right at the coast. One of these mountains, Aga, is very unusual — it looks like a huge pyramid, depending of the view. It is one of the points that our divers use as reference to find one of the best spots for shells. It is the place where they find species like *Pazinotus bodarti* P.M.S. Costa, 1996, *Muricopsis josei* E. Vokes, 1993, *Chicoreus spectrum* (Reeve, 1846),



Strombus pugilis form "worki" from Guarapari (left), normal form (right) from Ilhabela.

Favartia varimutabilis Houart, 1991, *Calliostoma gemmosum* (Reeve, 1842), *Calliostoma vinosum* Quinn, 1992, and other rarities. Guarapari is the city where we have our dive base and it is one great spot for shells. It is very easy to find many species in tide pools, sand bars and sand beaches. The fauna is almost completely tropical. The city has a good structure for tourism and it is really interesting to visit in a non-vacation time. For most of the year the city has about 50,000 people but during the summer time the population changes to a half-million! Most of the tourists are from the Brazilian central states and most of them have never had the opportunity to snorkel or dive. I remember one of the first times that Marcus and I went there to collect shells — our activity using our dive equipment turned us into a tourist attraction!

Vitoria is the state capital, a very nice city that deserves a visit. There are fine beaches where it is possible to collect some nice bivalves like *Tellina* and *Pitar*. Here, the Brazilian coast ends its most populated area and just few miles to the north the view changes a lot. It will be described in the September *American Conchologist*.

Such is the spell of the shell...

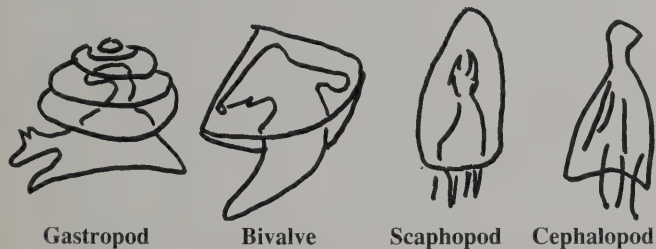
Hank Foglino, longtime COA member, Past Publicity Chairman, Vice President and President (1990-1991), and current Properties Director, is not a sheller. His wife, Mary Ruth is a fervid and devoted shell collector, but Hank belongs to COA and serves the organization simply because he likes COA. Make no mistake though...in spite of the fact that he is devoid of a proper collector's instinct, Hank loves the ocean, and has treated us to many programs over the years on his favorite topic, Oceanography. He recently completed a course in Biological Oceanography, and it seems we have rubbed off on him at last. Guess what his term paper topic was?

Sea Shells, Evolved for Survival

by Hank Foglino

The marine animals which live within shells show great variety in the edifices they build to enclose their soft body parts. A shell's structure must satisfy many purposes, and all members of any given molluscan species are consistent in following the design that has been developed for the greatest benefit to the individual animal's survival. This enclosure, the seashell, is primarily a home, and as such, it must be spacious enough to contain the animal. As the mollusk grows, the shell must be enlarged to accommodate the increased volume. It must, in addition, be a secure habitat, providing a safe haven against the efforts of a predator to enter and devour the animal within. It also serves as a vehicle which, depending on the species, may be used in crawling, burrowing and/or swimming. In some design configurations, the seashell can be used to grow food or as a weapon. Below I illustrate some of the features that have evolved to enhance the mollusks' survival in housing, locomotion, self-protection and food getting.

In the early fossil record we find very few fossils with protective shells and assume many of the creatures were soft bodied and decomposed completely after death. Fossils from the Cambrian period, which began about 500,000,000 years ago and lasted about 90,000,000 years, indicate that during that period many animals developed hard protective shells which remained after their death (Simon, 1976). Prey and predators developed together, and when the predators became more adept at taking their prey, early mollusks began to develop protective shells, and adapt them to house their soft bodies.



In a broad sense we can say that currently there are four basic configurations of shells as shown above (Andrews, 1981). These shell types belong to four of the major classes comprising the Phylum Mollusca. Shelled gastropods live in a single shell; bivalves use two shells that usually enclose the animal when they are closed; scaphopods live in a single shell open at both ends, resembling an elephant tusk; and cephalopods, mostly squid and octopus, have evolved to a degree that their shell is usually only an internal remnant. The Chambered Nautilus is a living exception. The two remaining classes are the chitons, rock dwelling animals protected by eight, hard, overlapping plates encircled by a leathery girdle to hold them in place; and the monoplacophorans, which include only a few deepsea species (Abbott, 1968) that have gastropod-like shells.

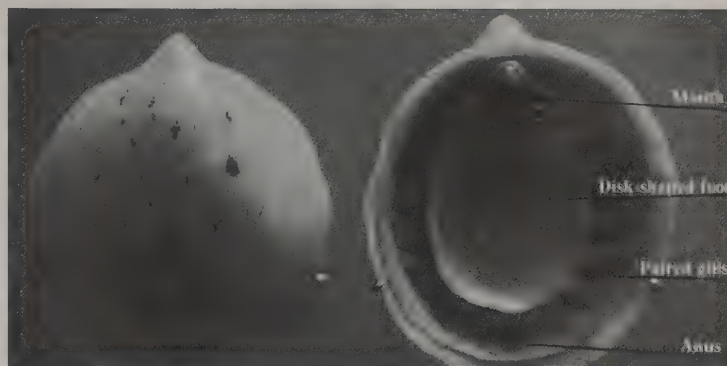
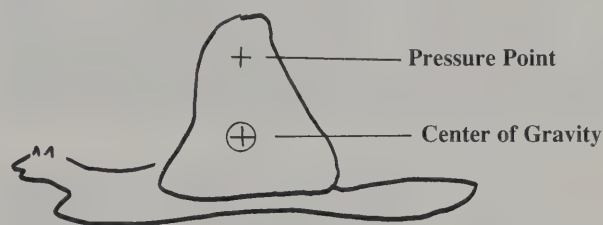


Figure 1: Monoplacophora. Greatly enlarged models of both sides of *Neopilina*. Original specimen was only .6 inch. (This illustration was photographed at the mollusk display at the National Museum of Natural History, Washington, D.C.)

The most primitive shells are presumed to have been one-piece, bilateral shells under which was a cavity to house the animal's body parts (Linsley, 1977). The mouth was at one end of the shell and the anus at the other. The primitive Monoplacophora are considered to represent this type of configuration (Fig. 1). It has many drawbacks. The visceral mass containing the digestive organs and other vital parts are exposed to attack by predators (Dance, 1976); the animal's sole defense strategy is to adhere to the substrate and pull its shell down over itself to protect its vital organs. This mode of defense is still used by a number of species. However, in other species, as the animal grew, the shell had to be expanded to accommodate the enlarged body, but horizontal growth was limited by how much surface area an animal could cover and still maintain a useful mobility. Vertical growth would raise the area of the shell above the center of gravity and result in the animal toppling over in any kind of pressure (Linsley, 1978). A natural solution to the problem was coiling, i.e., building the shell into a spiral as the animal grew, to maintain a more compact configuration, availing stability with increased living area.



Gastropods, shells which coil as above, are set apart from other mollusks by torsion, which is the embryological rotation of the viscera with respect to the foot of the animal (Linsley, 1978). Newly hatched gastropod larvae are configured like the monoplacophora with a bowl-shaped shell. At some point before they become part of the benthos, they undergo torsion, during which they twist their bodies around to bring the anus and mantle cavity containing the gills to rest over the mouth. Much speculation has been made over why this occurs and who benefits from it, the larva or the adult. The torsioned larva can withdraw more of its body into the shell; however the shell is thin and should not be any kind of deterrent to a predator. It has been argued that this is the beginning of the process that results in shell coiling, but the fossil record shows coiling occurred in primitive mollusks before torsion began.

The peculiar design of the primitive slit shells may be explained by torsion. Slit shells, exemplified in Figure 2 by *Perotrochus adansonianus*, have two internal gill feathers, one on each side of the slit (Abbott, 1976). Some scientists believe that the slit evolved to provide the hydrodynamics needed to direct the animal's excrement away from the feeding apparatus.

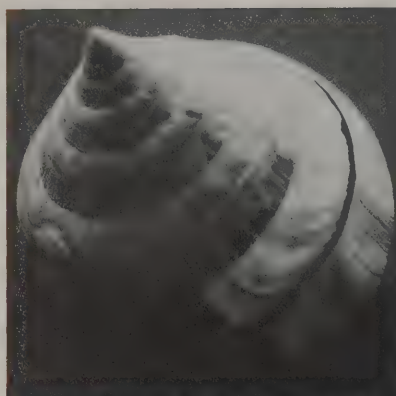


Figure 2: *Peretrochus adansonianus*

Shell Configurations

The benefits of a coiled shell include locating those parts of the animal unconnected with locomotion away from the shell aperture, thus moving them farther from harm's way. Regardless of whether the coils lie flat or rise above one another as they spiral, the growing spirals seem to conform to the logarithmic or equiangular spiral.

The logarithmic spiral has the unique property of maintaining its overall shape as the area within each coil increases. Therefore an animal living within its walls can grow larger and there will always be adequate space for it. While very successful in the analysis of coiling geometry, the spiral model is subject to criticism on theoretical and empirical grounds (Ackerly, 1989). Here we will assume that regardless of the geometric considerations concerning the actual shape of the shell, coiling offers a very advantageous alternative to a growing mollusk that must provide shelter for itself. As the shell coils, it can remain in the same axis when coiling (isotrophic), or move up or down. Most gastropods coil in the same axis, or coil downward from their spire. Figure 3 shows a Ram's Horn (*Spirula spirula*), which coils in the same axis, and a cutaway view of a Sundial (*Architectonica cylindricus*), which coils downward.

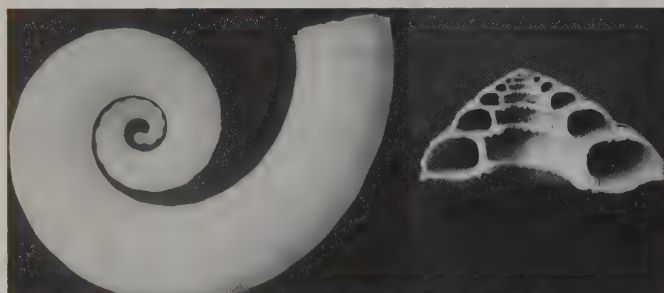


Figure 3: *Spirula spirula* (Photo by George Raeihle); *Architectonica cylindricus*

Many of the same-axis species are not mobile and attach themselves to the ocean substrate, while others, like the Ram's Horn, are free floating. The downward coiling whorls of the Sundial are loosely coiled, with the umbilicus (central opening) extending almost to the apex. This may give the animal a larger appearance, enhancing its defense against predators (Lellak, 1975). On the other hand, open coiling INCREASES the risk of predation by rendering the shell more fragile. A closed-coil shell has each whorl acting as a buttress to other whorls. In an open-coiled shell, each whorl is a stand-alone. Open coiling may occur as the result of other factors — for example, in the Sundials, larvae are brooded in the umbilicus. Other species have whorls tightly coiled around a central axis formed by a strong shaft called a columella.

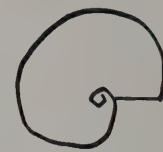
There may be minor deviations to the logarithmic cycle caused by environmental conditions or food variability. These variations are often detectable in the gastropod's spire: lean times may produce a somewhat convex apex. Though these deviations are slight, they may be used to study past environmental conditions.

Many gastropods have a "trap door," an operculum, which they use to close the aperture behind them when retreating from a hungry predator, but others revert to their ancestor's presumed main line of defense, clamping themselves to the substrate and holding their shells

tightly above them (Linsley, 1977). In order to be successful in hiding beneath a shell, the shell's aperture must be tangential to the last whorl to permit



Tangential



Radial

effective sealing. In species that do not use this type of defense, the aperture may be radial, which might require less energy to build, since it does not have to build further around to be tangential to the aperture.

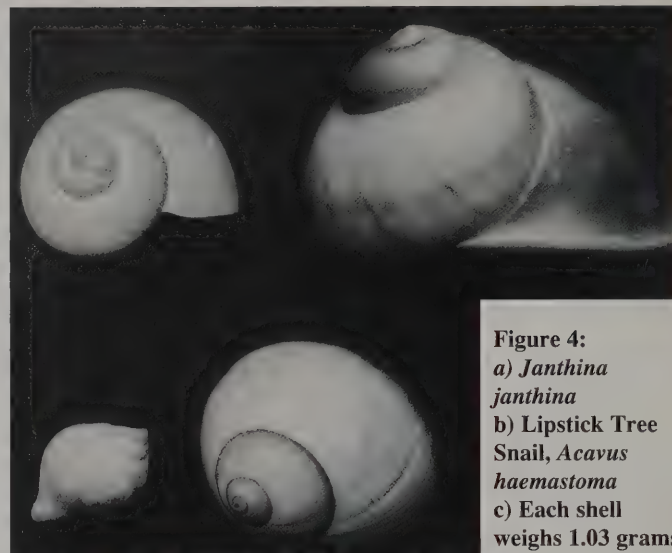


Figure 4:
a) *Janthina janthina*
b) Lipstick Tree Snail, *Acavus haemastoma*
c) Each shell weighs 1.03 grams

Examples of these types of configuration may be *Janthina janthina* (Fig. 4a) and the Lipstick Tree Snail, *Acavus haemastoma* (Fig. 4b). The tree snail lies exposed on whatever surface it occupies, and will clasp the surface, holding its shell tightly over itself, when threatened. The Janthina, on the other hand, floats at the surface and, having no substrate to grasp, need only have a radial aperture which does not require the additional expenditure of energy to build an aperture tangential with the last whorl.

A gastropod can also be configured as dextral (right-handed) or sinistral (left-handed). The "handedness" is determined by holding the shell with its apex up, aperture toward you. If the aperture is on the right side, the shell is dextral. Whether the shell is dextral or sinistral is determined by the way torsion occurs. As with torsion, the reason for the two configurations, mirror images of each other, is not understood. It should be noted that there are relatively few sinistral species and that some dextral species have aberrant sinistral individuals and vice versa.

Shell Structure

Shells are external skeletons composed of the mineral calcium carbonate, and built by porelike structures at the edge of the mantle, a skinlike cover that surrounds the internal organs of the animal. Building shells requires energy and time, and the animal is structured to maximize intake of resources at a minimum risk (Vermeij, 1993). *Janthina*, which floats at the surface of the water column, obviously does not need a thick, heavy shell to add weight and decrease buoyancy. The Atlantic Dogwinkle, *Nucella lapillus*, on the other hand, lives on wave-battered reefs and must expend much energy in building a thick shell rather than in growing a large body, because it must withstand the pounding of the waves and the impacts it must endure if dislodged by wave action. Figure 4c compares the sizes of a Dogwinkle and a Janthina, each weighing 1.03 grams. It should be noted that the geometry of certain conical shells is such that they are protected



Figure 5: a) *Nautilus pompilius* b) *Amussium japonicum*

against the wave buffering without having thicker shells, as is seen in *Patella mexicana* and *Concholepas concholepas*.

There are instances when a thin light shell is required and optimum strength is also important. An example is the Chambered Nautilus, *Nautilus pompilius*. This animal swims at great depths where the pressure is high, necessitating a "house" that can withstand the compressive forces of the environment. However, this animal also swims and cannot afford to carry a thick, heavy shell; as the animal grows it builds structural members, reinforcing areas which it no longer occupies. (Fig. 5a) The "transverse bulkheads" it builds behind itself brace the outer shell against compressive forces, and the compartments thus created provide buoyancy so that the animal can expend minimal energy while swimming.

Bivalves also utilize "reinforcement" designs, allowing them to have thinner shells. The Japanese Moon Scallop, *Amussium japonicum*, has built ribs across its two valves to strengthen its light shell (Fig. 5b).

Another method of maintaining a protective shell yet decreasing weight, and at the same time making more interior room, is shell dissolution (Signor, 1982), particularly evident in some of the species of the genus *Conus* (Kohn et al, 1979). As the shell grows by spiraling the outer lip around the columella, dissolution thins the inner protected walls and material is added to the spire. The resulting shell has a strong last whorl and a thickened spire, protecting it from crushing predators, and it has a greatly expanded living space for the animal, without a proportionally expanded shell.

Mollusks also show a remarkable ability to adapt to environmental changes. Studies done on the subtidal mussel *Mytilus galloprovinciale* (Raubenhumer, 1990) show that animals inhabiting a rocky habitat exposed to waves had less meat and thicker shells than those living in sheltered waters. When some of the young were switched to the opposite environment at birth, they emphasized shell or meat production as a function of the present locale, suggesting phenotypic rather than genetic influence, i.e., they allocate available energy where needed.

The availability of food also has an effect on shell structure. In the populations of the Periwinkle, *Littorina littorea*, it has been found that in sparse populations where food is plentiful, the shells are thin and globular, accommodating more body mass; whereas in dense populations with limited food, the shells were thicker and more elongated (Kohn et al, 1979). These shell changes are a function of available nutrients, and also a function of environmental conditions, which inscribe on the shells a detailed record of past events (Rhodes et al., 1970), i.e., that skeletal morphology over time may reflect environmental changes (Williamson, 1981).

Epifaunal vs. Infaunal

Most of the world's ocean bottoms are comprised of sand and/or mud, and the mollusks that live there either remain atop the upper surface (epifaunal) or they burrow into the substrate (infaunal). One prerequisite for surface habitat is the ability to remain on the surface and not sink into the bottom. This requires a large surface area and/or light

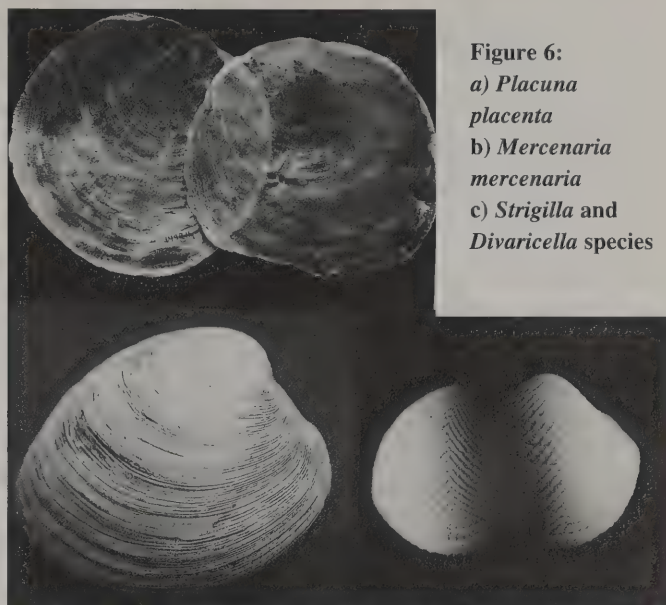


Figure 6:

a) *Placuna placenta*

b) *Mercenaria mercenaria*

c) *Strigilla* and

Divaricella species

weight. Such is the case with the Window Pane Oyster, *Placuna placenta* (Fig. 6a).

The great majority of sand and mud dwelling mollusks are infaunal (Watters, 1993). For them a rapid burrowing and anchoring ability are of prime concern. Most burrowing is done by pushing a "foot" down into the sediment, expanding it as an anchor, then pulling the rest of the shell and inhabitant animal down into the sediment. Tubular species such as the Razor Clam, *Ensis directus*, have very little trouble pulling themselves down into the substratum, and by virtue of their small cross sectional area they do so with little or no rotation.

Gastropods like *Oliva miniacea* have combined the tubular design with a very large foot to achieve an extremely fast rate of burrowing (Vermeij and Zipser, 1986). The Quahog, *Mercenaria mercenaria*, is not tubular, but has designed itself a wedge-like shape (Fig. 6b) which enables it to rock down as it burrows (Stanley, 1970). *Strigilla* and *Divaricella* have added another dimension to aid in the rocking mode of burial (Stanley, 1969). Chevron shaped ridges on the shell surface scoop up sediment and carry it to the surface as the animal rocks itself deeper into the sediment (Fig. 6c).

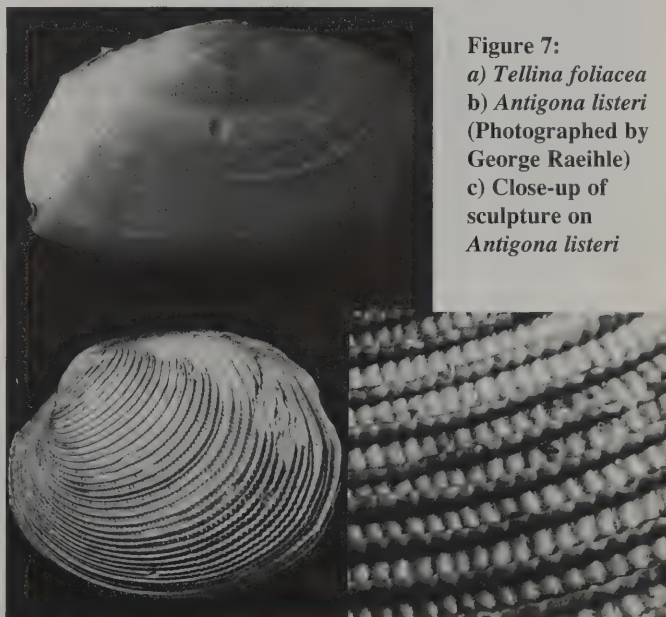


Figure 7:

a) *Tellina foliacea*

b) *Antigua listeri*

(Photographed by George Raeihle)

c) Close-up of sculpture on

Antigua listeri

The Golden Tellin, *Tellina foliacea*, (Fig. 7a) lives in muddy sand and, being a deposit feeder, requires an efficient mechanism for lateral movement when it has exhausted its food supply. This is an elongated species with discordant ridges that pass obliquely through the shell surface. Its rocking motions are rapid and small and as it rocks the anterior and posterior portions of the ridges alternately grip and slide through the sediment (Stanley, 1969).

Once the mollusk has interred itself in the sediment, its aim is to remain buried. If dislodged by hydrodynamic disturbance or an excavating predator, it will be exposed to attack until it can reburrow. The most basic way to stay buried is to have some sort of apparatus to offer resistance against motion toward the surface. In many mollusks this takes the form of irregularities or protrusions on the shell. These protrusions are quite obvious on the shell of the Venus Clam, *Antigona listeri* (Fig. 7b). If we examine these knobs closely (Fig. 7c), we note that they are shaped in such a manner as to minimize interference downward and maximize power against upward motions (Watters, 1994).



Figure 8: *Opeatostoma pseudodon*

(Fig. 8) feeds on barnacles and has evolved a spear with which to probe into the barnacle's aperture.



Figure 9: a) Deer Cowrie b) Music Volute

have modified their apertures with knobs or teeth in an attempt to restrict the manipulation of predators' claws and to reinforce the aperture, in order to prevent peeling of the apertural lip. The cowries (Fig. 9a) and volutes (Fig. 9b) are excellent examples of this modification. Because of these knobs a predator has a difficult time trying to maneuver its claws around the entrance to a cowry's shell (Scare et al., 1975).

Another scheme to protect a mollusk from a predator is to make it difficult for the predator to get the shell into its mouth. The Venus Comb, *Murex pecten* (Fig. 10a), the Prostitute Venus, *Pitar lupanaria* (Fig. 10b), and the Arthritic Spider Conch, *Lambis arthritica* (Fig. 10c), seem to be excellent examples of this type of shell design. These shells are often used as classic examples of shell design vs. predation.

Predator and Prey

As predators, mollusks have developed an array of methods to obtain prey, such as venomous stingers and radulae which are used to scrape a hole in the shell armor of other mollusks (Vermeij, 1987). Here, however, we are only concerned with the use of the shell in predation. Some members of the Busyconinae, Melongenidae, Buccinidae and Fasciariidae employ the strong edge of their outer shell lip to wedge open the clamped shells of bivalves. It is not uncommon to find these animals with broken, chipped and/or scarred outer lips. The Thorn Latirus *Opeatostoma pseudodon*

Among the earliest developments in the marine predator's arsenal were claws with which it was not only able to grasp its prey but also to reach into crevices or shell apertures in an effort to pull the animal out of its hiding place.

Some gastropods



Figure 10: a) *Murex pecten* b) *Pitar lupanaria* c) *Lambis chiragra arthritica* Though it has been said that this shell was the inspiration for the Opera House in Sydney, Australia, its design was in all probability meant to give the animal the means to monitor a greater area with minimal risk. If the oyster is on the bottom and wants to open up to feed, it will want to detect predators to the maximum height above it. By having a saw-toothed configuration, it can sample the water to the height of x millimeters by opening its valves a distance of y millimeters, thereby being able to scan a maximum area while opening to predator intrusion a minimal distance between its valves. In addition, the area opened to water circulation for filter feeding is greatly increased using the saw tooth pattern.



The heart cockle, *Corculum cardissa* (Fig. 11b), lives on the surface of hard reef flats. Portions of the shell are translucent and the animal uses its shell as a greenhouse, getting most of its nutrition from algae grown in its own flesh, just under the surface of the thin shell (Abbott, 1976). The broad upper surface has modified translucent crystals oriented to catch the sun's rays to help the algae grow. The shells occur in various colors. Since the color determines what wavelengths are being absorbed within the shell, this writer feels it may be possible that these bivalves are selectively harboring algae that thrive on photic energy, based on the shell's coloration, in a particular band of the electromagnetic spectrum. However, to date, this supposition has not been considered by the scientific community. (Personal communication, Dr. Paula Mikkelsen, Curator of Malacology, American Museum of Natural History)

Leonardo da Vinci, who seems to have studied molluscan architecture, stated, "The creature that resides within the shell, constructs its dwelling with joints and seams and roofing and the other various parts just as man does with the house he inhabits and this creature expands

However, we should not discount the aspect of stability. The Spider Conch is a large shell, not easily crushed and eaten, even without protruding horns, and the Venus Comb is brittle and easily crushed by the strong jaws of a predator. It may be closer to the truth that the spines and horns are more for stabilizing the shell on its substrate, preventing it from overturning or being moved about by the currents, than for frustrating predators.

Specialty Design

The Coxcomb Oyster, *Lopha cristagalli* (Fig. 11a)

has what may be described



Figure 11: a) *Lopha cristagalli*
b) *Corculum cardissa*

the house and roof gradually in proportion as its body increases and as it is attached to the sides of these shells." (Dance, 1976).

We have only scratched the surface of the design and utilization of molluscan shells. Many studies have been, are being, and will be performed on every aspect of shell design that has been touched on herein. Much is yet to be learned. However, we can say with assurance that the creatures inhabiting the shells are master builders, balancing energy requirements among growing, reproducing, and providing a safe, efficient haven for their time here on earth.

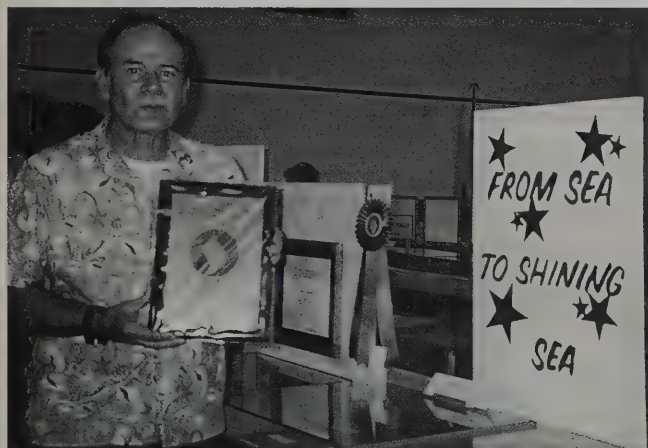
Acknowledgments

I'd like to thank Dr. Paula Mikkelsen, Curator of Malacology, Museum of Natural History, New York, for sharing her knowledge with me and allowing me to photograph shells from the museum's collection. I'd also like to thank Dr. Glen Lopez and Dr. Robert Cerrato of the Marine Science Research Center, New York State University at Stony Brook, New York, and Dr. G. Thomas Watters of the Ohio Biological Survey, Columbus, Ohio for their help and support.

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COA TROPHY WINNER



Veteran collectors Jim and Bobbi Cordy took the honors at St. Petersburg Shell Show held the last weekend of February this year. Their exhibit, "From Sea to Shining Sea," contained self-collected shells from California and Florida and included many rare species. Nice work, Cordys! For more winners, see page 31.

Littorinid Variation

Variation of shell shape and color continues to interest biologists, who are beginning to see the phenomenon as much more than a product of inherited traits. Littorinids are among the most variable of mollusks, and have come in for their share of study. At the Fifth International Symposium on Littorinid Biology (Cork, Ireland, 1996) it was reported that ecology plays a part in the appearance of littorinids. Michael Johnson showed how faster growth produces flatter shell shapes in the Australian littorinid *Bembicium* by transplanting them among various microhabitats in the Abrolhos Islands. Hans de Wolf described contrast between striate and nodulose shells of *Littorina striata* in the Azores, which may also be an environmental effect. Anette Ekendahl tested ideas that birds exert visual selection on the extremely variable *L. saxatilis* in Iceland. Sergei Sergeivsky described correlations between color frequencies and salinity in the White Sea.

*See "Do Spots Equal Stripes" by Ross Gundersen and Russell Minton, *American Conchologist* 25(4) December 1997) for work done on Neritidae.

Answers to Betty Hunter's Pecten Quiz (March 1998)

1. *Argopecten circularis* (Sowerby, 1835)
2. *Parvamussium thetidis* (Hedley, 1802)
Thetis genitive case = *thetidis*
3. *Flexopecten proteus* (Dillwyn, 1817)
4. *Chlamys denticulata* (Adams & Reeve, 1850)
5. *Chlamys princessae* (Kuroda & Habe, 1971)
6. *Decatopecten strangei* (Reeve, 1852)
7. *Lissopecten hyalinus* (Poli, 1795)
8. *Bathypecten vulcani* Schein & Fatton, 1985
9. *Chlamys empressae* Kuroda & Habe, 1971
10. *Chlamys cookei* Dall, Bartsch & Rehder, 1938
11. *Chlamys linki* (Dall, 1926)
12. *Chlamys vestalis* (Reeve, 1853)
13. *Pecten arthriticus* Reeve, 1853 – Syn for
14. *Nodipecten noduliferus* (Sowerby, 1842)
15. *Chlamys livida* (Lamarck, 1819)
16. *Chlamys incantata* Hertlein, 1972
17. *Argopecten rehderi* (Grau, 1960)
18. *Chlamys cytherea* Bavay, 1904
19. *Chlamys euterpes* (Berry, 1957)
20. *Chlamys senatoria* (Gmelin, 1791)

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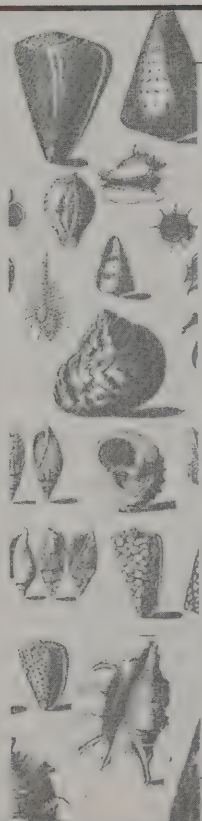
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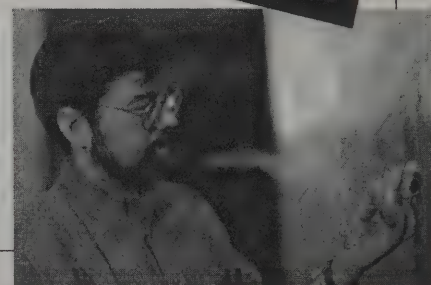
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The Subfamily COLUMBARIINAE in the Western Atlantic

By Kevan and Linda Sunderland



Fulguroides atlantis (Clench & Aguayo, 1938). 39 mm. 800 m., Cayman Trench.



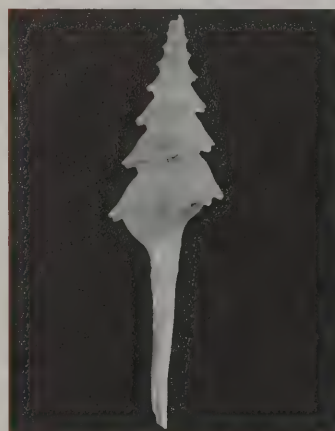
Fulguroides atlantis (Clench & Aguayo, 1940). 30 mm. 700-800 m., Cayman Trench



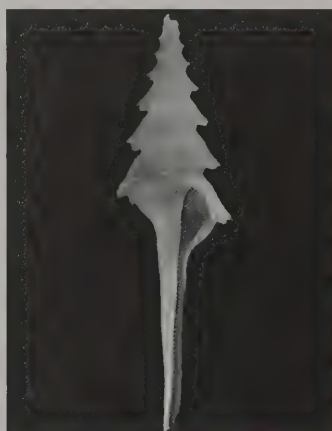
Fulguroides aurora Bayer, 1971. 29 mm. Dredged 100 fms., Off Carysford Reef, Florida Keys. DIETER COSMAN COLLECTION



Fulguroides bartletti Clench & Aguayo, 1940. 40 mm. 500 m., N. coast of Jamaica.



Fulguroides bermudezi (Clench & Aguayo, 1938). 30 mm. 800 m., Florida Straits, off Key West.



Fulguroides brayi Clench, 1959. 45 mm. 300-400 m., off Cayos Miskitos, Nicaragua.



References:

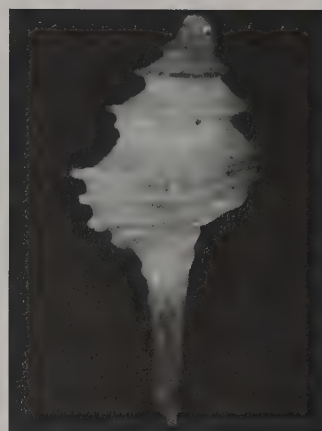
Abbott, R.T. 1974. *American Seashells*, 2nd Ed.

Bayer, F.M. and G.L. Voss, 1971. New and Unusual Mollusks Collected by R-V John Elliott Pillsbury and R-V Gerda in the Tropical Western Atlantic. *Studies in Tropical American Mollusks*, University of Miami Press, pp 111-236.

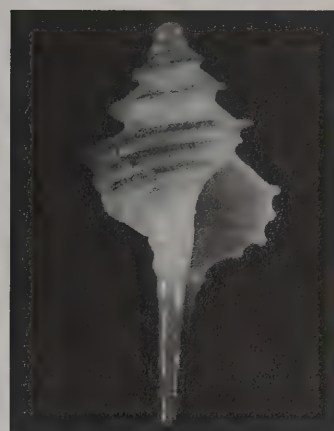
The intent of this feature is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



Fulguroides brayi Clench, 1959. 42 mm. 200 m., off North Coast of Colombia.



Fulguroides ephoroides Harasewych, 1983. 7 mm. 200-250 m., off São Luiz, Brazil.



Fulguroides electra Bayer, 1971. 25 mm. 900 m., Florida Straits off Key West.



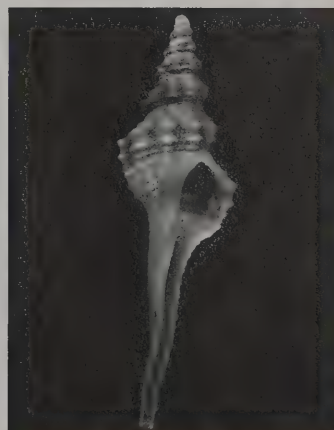
Fulguroides timor Harasewych, 1983. 45 mm. 800-1000 m., off Cape Fear River, NC.



Fulguroides xenismatis Harasewych, 1983. 36 mm. 200 m., off Honduras.



Fulguroides species. Data unknown. From an old collection.



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REVIEWS

Atlas of the Mediterranean Seashells, Vol. 2 (Caenogastropoda parte 1: Discopoda — Heteropoda. Riccardo Giannuzzi-Savelli, Francesco Pusateri, Alberto Palmeri and Claudio Ebreo. La Conchiglia Edition. Rome, 1996. 258p. 925 photos. Hardbound.

Published under the patronage of the Italian Society of Malacology (S.I.M.), *The Atlas of Mediterranean Seashells* is a milestone in European malacology, says Philippe Bouchet of the Muséum national d'Histoire naturelle, Paris. The *Atlas* is a multi-volume effort, the third and most evolved generation from a series of such catalogues of the molluscan fauna of the Mediterranean, and it is the first to be lavishly illustrated.

Volume 1 of the *Atlas*, previously published, treated the Archaeogastropoda. Volume 2 covers the first two suborders of the Order Neotaenioglossa: Superorder Caenogastropoda (this division includes most of the old group known as Mesogastropoda): the first suborder treated is the Discopoda, including the Cerithiidae, Littorinidae, Xenophoridae, Strombidae, Aporrhaidae, Triviidae, Cypraeidae, Oculidae, Naticidae, and the Superfamily Tonnoidea; the suborder Discopoda also encompasses a host of smaller families, less familiar to the average collector. Among this group is the Rissoidae, a remarkable case of species radiation in the Mediterranean — some 145 species which are pictured in the *Atlas*. The second group is from the much smaller suborder, the Heteropoda, which includes the Carinariidae, the Atlantidae, and the Fiolidae.

It is important to note what this "Atlas" is and what it is not. It is not a detailed guide to the shells of the Mediterranean in the usual sense. No extensive descriptions are included, and no synonymies. Nor does it concern itself with life history, habitat, or ecology. It is an atlas, telling what shells are found where in the Mediterranean. And it pictures, in crisp, clear color photos, each of the species, usually in multiple views. Species are defined in the *Atlas*, in fact, by a lavish series of these photos, from multiple localities, in multiple forms and colors, including freaks. In this sense it is a marvelous aid to identification. Thirty-seven forms of the extremely variable *Cerithium vulgatum* are shown. The bewildering diversity of the family Rissoidae in the Mediterranean is greatly simplified by a wealth of photos (23 pages of them), including some SEM photos of nuclear whorls and of microscopic species. A lovely array of Mediterranean aporrhaidae, 20 different specimens of *Cypraea spurca*, and an entire page (20 photos) of the umbilical zones of Naticidae make this book a must-have for anyone who collects Mediterranean shells or specializes in any of the 44 families it treats.

It is true that the majority of the specimens pictured are from Italian waters: all the specimens shown in the *Atlas* of the amphimediterranean species, *Cypraea spurca*, are Italian. Broader representation would seem indicated. Yet examining the variety of forms from Italy alone makes one wonder how much more variation there could be! Some may question the taxonomy. European species often have huge synonymies and there is much splitting of taxa. But this is a concern of lumpers. Besides, the authors state in the Foreword that they welcome critical review and hope their work stimulates "new and deeper studies," while stressing that their proposed identifications "correspond to the most commonly held opinions of recent authors."

The book consists of two main parts: first is a "Catalogue of the species," a taxonomic listing of the species included in the *Atlas*, with authors, helpfully including the genera to which the species were originally assigned. The Catalogue is followed by the "Tables" which occupy the bulk of the book. It is here that we encounter the very clear and beautiful illustrations. Because these Tables don't always follow the order of the taxonomic listing in the Catalogue, it would have been

a boon to cross-reference page numbers or assign species numbers throughout. But we're talking about a small issue in an otherwise beautiful and capable production. This is a series to keep up with. More to come! —L.S.

Coastal Paleooceanography of Eastern North America (Miocene — Pleistocene) by Edward J. Petuch. Kendall/Hunt Publishing Co. Dubuque, Iowa, 1997. 8.5" X 11", 373 pp. Paper bound.

Here's a book that should hold interest for any of us with a fixation on fossil mollusks, oceanography, geology, or the geography of the Eastern Seaboard, from the southern and western reaches of the Florida peninsula to Nova Scotia. Dr. Petuch wore many hats in writing *Coastal Paleooceanography of Eastern North America (Miocene — Pleistocene)*, as he tells us in his Preface. He had to be, among other things, a physical oceanographer, a historical geologist, a paleontologist, paleoecologist and paleobiogeographer, a taxonomist, and a biostratigrapher as he set out to describe the American Atlantic coastline and all its permutations through the entire Neogene. From the widely oscillating temperature regimes and consequent massive extinctions of the Miocene and Pliocene, through the deep cold of the predominantly glacial Pleistocene, great climate changes and corresponding melting or freezing of the glacial features of the continent made immense changes in the size of our eastern subcontinent and the position of its coastline, not to mention the life forms that inhabited these mutable waters.

Reading this book, one can follow the development of Florida, and its molluscan fauna, through all its fluctuations of the ocean levels and temperatures. Once a skinny, pincer-tipped island, cut off from the coast of a much-reduced Georgia by a shallow trough in the high-water Miocene periods; later a wide, stubby SuperFlorida, roughly twice today's size, in the late Pleistocene ice ages, when much of the ocean's water was locked up in vast ice sheets; today's Florida peninsula and its mollusks evolve as we look on with the guidance of Dr. Petuch. Similar, though not quite as detailed, slides through time are created for the more northern regions of the Eastern Seaboard, all the way to Nova Scotia, amazingly once part of the temperate-to-subtropical Carolinian Molluscan Province.

The first three chapters each cover the topic through the eyes of the three major disciplines with which the author views his subject: "Marine Paleogeography of Neogene Eastern North America," "Environments of the Neogene Seas of Eastern North America," and "Marine Paleobiogeography of Neogene Eastern North America." Each of these chapters treats its topic through each of the three epochs of the Neogene. And each has its own glossary, handy to the novice.

Three more chapters treat the mollusks of their respective epochs, Miocene, Pliocene and Pleistocene, with copious photographs of the significant fossil mollusks for each geologic formation. And three special-topic chapters complete the body of this work: the first, a monograph on those highly popular and significant index fossils, the ecphoras, holds much information for the fossil buff. Paleocypraea collectors will be quite pleased to see Dr. Petuch's extensive treatment of those extinct and mysterious *Siphocypraea* of the Florida fossil pits. (Anyone who has collected just one of those big, glossy, golden and tan cowries of the Sarasota pits will find it interesting to read that the *Siphocypraea* were gregarious animals, living "in immense colonies that must have dominated several of the Okeechobean ecosystems." Another chapter examines the geologic history of the coral reefs of the Everglades region and their molluscan inhabitants. An Appendix on the "Paleolimnology of Pleistocene Lake Okeelanta" draws the interest of the freshwater collector. This precursor to Lake Okeechobee was at one time a sea, and then a huge freshwater inland lake, before it settled into its present shores, to be further reduced by the agricultural and hydrologic demands of man.

All this immense span of life and time is made more comprehensible to the novice and the amateur paleomalacologist by the addition of a number of aids: the aforementioned glossaries, abundant maps of Florida and the Eastern Seaboard through the timespan of their evolution, a geologic time scale, mapping of currents, a bibliography and an Oceanographic and Geologic Index as well as a Systematic Index. A listing of the Neogene provinces and their "component stratigraphic units," arranged chronologically and by faunal province, is quite useful to any novice trying to comprehend these subdivisions of geology. A section explaining index fossils is also very helpful. Quite a few of Dr. Petuch's charming drawings of the molluscan assemblages in his "ecological block diagrams" augment and decorate the text, showing the animals in life, surrounded by the species with which they share their habitat. No new species are described.

Much can be said about this book, given its immense undertaking and broad scope. And it will certainly be evaluated on a variety of levels. But when all is said, it remains a very useful book to the fossil hound, to the amateur geographer, and to the shell collector. And it is studded with fascinating bits of information. Did you know that the wide, elevated and expanding, T-shaped ribs on some *Ecphoras* nearly meet, and form a "double shell" with a hollow between the two layers? Quite a nice deterrent to a boring predator. Were you aware that the probable reason for the total extinction of those many beautiful species of *Siphocypraea* was that the entire genus was confined to intertidal to shallow subtidal living? Although their kind diversified to live in the numerous tropical habitats available – open lagoons, coral reefs, and muddy estuaries – none of them ever evolved, in spite of this seemingly great versatility, to live in deep water. This "oversight" made them, at last, victims of the great early Pleistocene drops in sea level which narrowed their habitat to a mere fraction of what it had been. And did you know that *Siphocypraea griffini* is apparently the very last species of its genus? Have a look. You'll find Dr. Petuch's book both an impressive accomplishment and lots of fun. —L.S.

Recent Cassidae by Kurt Kreipl. Published by Verlag Christa Hemmen, 1997. 151 pages. Approx. 8.75" x 12." 24 color plates. Numerous drawings. Hardbound. Price from the publisher: \$65 plus postage and handling.

This is the first major work on the entire Cassidae family since Abbott's 1968 *Helmet Shells of the World (Cassidae), Part 1*, appearing as a monograph in *Indo-Pacific Mollusca* V. 2, no. 9. Kurt Kreipl's new work is much more complete, as Abbott never published *Part 2*, and *Part 1* only covered *Cassis*, *Cypraeocassis*, *Casmaria*, and *Phalium*. The *Sconsia*, *Galeodea* and *Morum* (the last now in the Harpidae) were not covered. Since then many changes in systematics have taken place and some new species have been discovered.

The false tuns, Oocorythidae, are now in the Oocorythinae, a subfamily of Cassidae, and they contain three genera, *Oocorys*, *Hadrocorys* and *Dalium*. On page 67 the author details the history of

this reclassification and explains that he is following the work of Bouchet and Waren (1993). But, oddly, a page entitled "Systematics of the Cassidae" which lists the superfamily, family and all subfamilies, genera and subgenera of the Cassidae, only lists two subfamilies, Cassinae and Phaliinae, ignoring the Oocorythinae. He says on page 9, "A 'family,' whose systematical position within the Cassidae is uncertain, are the Oocorythinae."

Abbott considered *Semicassis* as a subgenus of *Phalium*. Kreipl upgrades *Semicassis* to full generic status containing two subgenera, *Semicassis* and *Antephalium*.

I appreciate the explanation and illustration of the "collector's item" species, *deshayesi*: "On dealers' lists one will sometimes find the species *Cassis deshayesi*. This is, in fact, not a member of the Cassidae but a relatively uncommon species of the Cancellariidae from West Africa. The correct name is *Loxotaphrus deshayesi* (Duval, 1841)."

Several species described in the '70's, '80's and '90's will be seen here for the first time, including *Galeodea (Galeodea) hoarui* Drivas & Jay, 1989, *Echinophoria oschei* Muhlhauser, 1992, *Sconsia alexarthuri* Parth, 1994, *Semicassis (Semicassis) westralis* Kreipl, 1997 and the Oocorythinae species, *Hadrocorys dorae* Kreipl & Muhlhauser, 1996.

Immediately a favorable impression is derived from the striking, richly colored illustrations. Only the finest quality specimens are shown, including odd color forms, dwarfs and juveniles, and freaks. In addition to the 24 color plates, the text has detailed black and white drawings by Dora Jagle. The text for each species contains sections on Type locality, Range, Description, Habitat and Synonymy, as well as occasional Remarks.

In the back of the book are two indices. "List of Recent Taxa of Cassidae" lists alphabetically all known species names of cassids, giving validity of the name, and a valid name in case of invalidity. The other is an "Index of Valid Taxa of Cassidae" which lists alphabetically all valid species with a species number in lieu of a page number, and a plate number where it is illustrated.

The author admits that he is an amateur conchologist and that some information may be lacking concerning types, details on ecology and habitat of certain species, etc. Still, this is the definitive work on a popular family of large, attractive shells, and should be of interest to collectors and professionals alike. I have a strong personal appreciation for Kurt Kreipl's work. I spent a long time assembling an educational exhibit of the Cassidae which was shown in 1980. It involved years of acquiring specimens and included enlarged, detailed illustrations of protoconchs and opercula, sliced shells showing internal sculpture, preserved egg capsules, species of echinoderms known to be fed upon by cassids, and more. Friends suggested I write a book on the helmet family for collectors, since I had almost every species and there was a need for it. That need no longer exists, since the publication of Kreipl's excellent work, which is available at such a reasonable price. I would be very proud had I been the author. —G.E.



Walter Sage Fund

by Bobbie Houchin, COA Treasurer

Walter Sage, Collections Manager of the American Museum of Natural History, was one of COA's mainstays and longtime Treasurer of the organization. After Walter's death in July 1995, COA, wishing to honor Walter in a way he would approve, put in place a fund in his memory for grants to education. This fund has been administered by the Academy of Natural Sciences, Philadelphia, under the care of Dr. Gary Rosenberg. Our goal was, and still is, to increase that fund for the

benefit of education in malacology. Meanwhile, Walter's mother donated to COA Walter's shell fabric collection for sale to help build the Walter Sage Fund. The proceeds from the sale of that fabric were kept and administered by COA, and the fund was known as the Walter Sage Fund #2.

The Walter Sage Fund #1 has now been transferred to COA. The total amount in these two funds is \$12,175.00. Guidelines for administering both of these funds were put in place by the COA Board of Directors. Grants have been given and will continue to be given from both of these funds according to these guidelines.

FRESHWATER PEARLY MUSSELS: Pigtoes and Ortmann's Law

by Daniel L. Graf

The esthetic and scientific value of freshwater pearly mussels has captured the interest of collectors and biologists in North America for nearly 200 years. One difficulty inherent in the study of these bivalves is their almost unimaginable conchological variation. Since taxonomists began describing the American mussel fauna, they have debated whether differences in the shapes of various mussels were due to their belonging to different species or whether they were simply the result of within-species heterogeneity.

It has long been observed that many freshwater mussels vary climally; that is, over the geographic range of a particular species, as the environment in which the animal lives transitions into another, so does the form of its shell. Gradual habitat variation is typical of a long reach of river: the headwaters are very different from the largest parts of the river near the mouth. The transformation from one extreme habitat to another, however, occurs incrementally along the length of the stream.

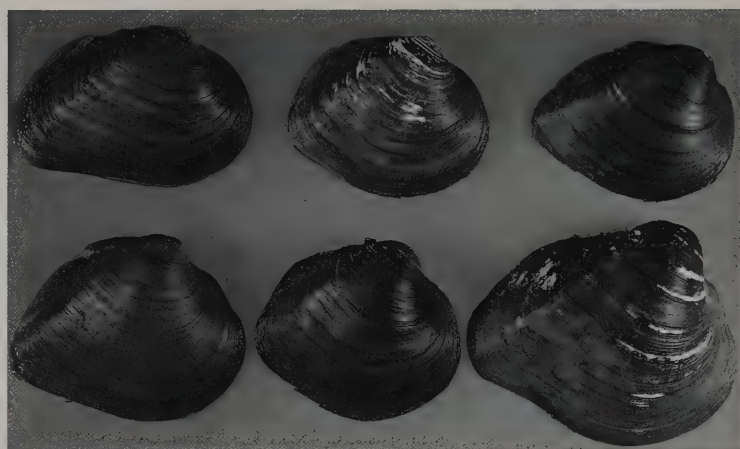
One of the earliest and most important researchers to address this phenomenon was Dr. Arnold E. Ortmann (1920). For many of the freshwater pearly mussels of the upper Ohio River, Ortmann demonstrated that, as he sampled from the headwaters to the larger river, their valves grew more laterally obese, were less elongate, and acquired more robust umbos. This type of clinal conchological variation is now known as *Ortmann's Law of Stream Station*.

An example of the effect of Dr. Ortmann's work was the change in taxonomy of *Fusconaia flava*, the Wabash Pigtoe. Historically, this species was thought to be two: *Fusconaia flava* was the laterally compressed, elongate form occurring in the headwaters and medium-sized rivers, while *F. undata* occurred downstream in larger streams. Besides the ecological difference, *F. undata* also exhibited an extreme "big river" morphology, having an obese, almost trigonal, shell. However, once it was suggested that the *flava*-type shell of the smaller rivers was connected to the "big river" *undata*-type by a series of intermediate forms, the Wabash Pigtoe was united as a single species.

A challenge to the single-species hypothesis for the Wabash Pigtoe, however, was that the "big river" *undata*-form had not been collected from the northward flowing Red River of the North of Minnesota, North Dakota, and Manitoba. This struck me as surprising since the United States' portion of the Red River drains roughly 109,000 square kilometers; the Illinois and Wabash Rivers of Illinois and Indiana drain only 72,000 km² and 77,000 km² respectively, yet the "big river" form of the Wabash Pigtoe can be found in both of these large-but-smaller streams. For science to be dealing with a single species, there must be a fundamental difference between populations of the Hudson Bay and Mississippi drainages for Ortmann's Law to operate in one basin but not in the other.

What if the Wabash Pigtoe really was two species? In that case, the absence of one species, *Fusconaia undata*, from the Red River and the presence of the other, *Fusconaia flava*, would not be so difficult to explain. Only a limited freshwater mussel fauna gained access to the Red River with the close of the last ice age; *F. undata* simply may not have made it across the continental divide while *F. flava* did. If the Wabash Pigtoe really was two species, I predicted I should be able to distinguish two distinct shell types in the upper Mississippi basin, the parental stock from which the Red River was populated.

To test this prediction, I measured hundreds of Pigtoes from the upper Mississippi and Ohio Rivers, the Great Lakes, and the Red River of the North in order to determine the geographical and ecological distribution of the various morphotypes. I used three different indices to



Shells of *Fusconaia flava* demonstrating Ortmann's Law of Stream Station. Moving across each row, we start with a creek form in the upper left, and end with a specimen from the Mississippi River in the lower right. Notice the change in shell proportions, such as higher umbos, and more inflated shell. Specimens are from Ohio State University Museum of Biological Diversity. Photo by G. Thomas Watters

quantify the shape of each pair of valves. The width index was calculated by dividing the lateral obesity of the shell by its anterior-posterior length; the height index was the ratio of the dorsal-ventral height to the length. These quotients enumerated the relative obesity and elongation of a shell, respectively. An index of umbo height characterized the development of the umbos and was simply the projection of the umbo above the hinge line divided by the height of the shell. The use of ratios allowed me to make comparisons among the mussels of different absolute sizes.

I could have treated all *Fusconaia flava* equally as had been done in the past. I would surely then have accounted for every conceivable combination of shell obesity, elongation, and umbo inflation. However, the Wabash Pigtoe occurs in a variety of habitats. All *Fusconaia flava* are not equal; a headwaters Pigtoe is conchologically very different from one further downstream.

To quantify the habitat of each measured specimen, I calculated the average daily discharge of each collection locality from data made available by the U.S. Geological Survey on the World Wide Web (<<http://water.usgs.gov>>). Each measured Wabash Pigtoe was then assigned to one of eight discharge classes based on the average daily discharge of the locality from which it was collected: 0 (i.e., lakes), 1 to 30, 31 to 80, 81 to 160, 161 to 270, 271 to 540, 540 to 2700, or greater than 2700 cubic meters per second (m³ s⁻¹). I then analyzed average width, height, and umbo height indices among discharge classes using both parametric and non-parametric statistics to determine whether variation in shell morphology varied according to changes in habitat.

Besides separating *Fusconaia flava* among habitats, I also compared them within each discharge class by plotting "scattergrams" of the umbo height index vs. the width index. By considering Wabash Pigtoes from one discharge class at a time, I greatly reduced the degree of environmental variation among specimens. This allowed me to assume that much of the variation among specimens in a particular habitat was genetic. I predicted that if *Fusconaia flava* was indeed a single species, I should only find one basic shell type per habitat and a single cluster of points on each scattergram. On the other hand, I should find two distinct shell types, and two clusters of points per discharge class if the Wabash Pigtoe was composed of two distinct, reproductively-isolated species. A more thorough account of these methods can be found in Graf (1997a).

So what did I find? Firstly, within each discharge class, only a single cluster of morphologies was evident in the scattergrams; this led me to conclude that the Wabash Pigtoe is indeed composed of a single species: *Fusconaia flava*. I also demonstrated statistically that in the upper Mississippi and Ohio Rivers, the Great Lakes, and the Red River of the North, the shape of *Fusconaia flava* varies significantly with habitat: as average daily discharge increases, mean shell obesity and umbo development increases while the degree of elongation decreases. Ortmann's Law of Stream Station predicts exactly such a distribution of shell types. These results bring the taxonomic status of *Fusconaia flava* right back to where it was before I ever picked up a caliper, but we are still left with the question of why the "big river" undata-form is absent from the Red River of the North.

Having rejected the hypothesis that the Wabash Pigtoe is composed of two species, we are forced to speculate on the differences between the populations of *Fusconaia flava* in the Red River of the North and those of the upper Mississippi. Populations in the Red River may be genetically less variable than the others. I have found that the Wabash Pigtoe, among other freshwater mussel species, may have colonized the Hudson Bay drainage via stream capture; that is, mussels living in the headwaters of a tributary of the Mississippi were "captured" when that stretch of stream changed direction to flow into the Red River of the North (Graf, 1997b). The current population of *Fusconaia flava* in the Red River may have been founded by only a few individuals, and this sort of genetic "bottle-neck" may explain the observed reduction in potential phenotypes.

There are also habitat differences between the Red River and the upper Mississippi. Consider again the Red, Illinois, and Wabash Rivers. Although all three of these large rivers drain areas of equivalent size, the two Mississippi basin tributaries have average daily discharge values roughly five times greater than that of the Red River — 135 m³s⁻¹ versus 595 and 708 m³s⁻¹ for the Illinois and Wabash respectively. So, although the Red River of the North drains a large area, its average daily discharge is that of a smaller stream the size of the Scioto River of southern Ohio. The undata-form does not occur in that river either.

We can be satisfied that the observed morphological variability of the Wabash Pigtoe is due to environmental influences and not to two

or more distinct species being lumped together as one. However, there remains the problem of the mechanism by which Ortmann's Law of Stream Station maintains this variation throughout the range of the mussel. The hypotheses of environmental and genetic differences between populations in the Red River of the North and Mississippi basins are not mutually exclusive, and they remain in need of further testing.

The Great Lakes basin may also provide further opportunity for the study of Ortmann's Law and its effect on *Fusconaia flava*. Although typical undata-type Pigtoes are absent from that basin as well (contrary to much of the literature), "big river" analogs can be found in such systems as the Grand River of Michigan and in Lake Erie.

Acknowledgments

This study was undertaken while I was a graduate student at Northeastern University, Boston, MA and forms part of my M.D. thesis (Graf, 1997a). Profs. E. Ruber and G.S. Jones of Northeastern and R.I. Johnson of the Museum of Comparative Zoology, Cambridge, MA served as my thesis committee and provided invaluable assistance, advice and encouragement; K.J. Boss (Harvard) and J.C. Underhill (U of MN) were also integral in getting this study off the ground. Specimens were loaned by P. Kelley (U of ND, Grand Forks); D. Ó Foighil et al. (U of MI, Ann Arbor), G. Rosenberg (Academy of Natural Sciences, Philadelphia) and R. Hershler (National Museum of Natural History). This particular facet of my thesis work was funded by the Conchologists of America, Inc. My parents made their vehicles and home available for research transportation and a field station, respectively. My thanks are extended to all of the above.

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For the Record:

Almost a year ago, at the Captiva COA convention in July 1997, amateur malacologist, book dealer, and collector of interesting malacological minutiae Dick Petit gave your editor the manuscript of the following small article, a comment on Peter Dance's "Junonia" reminiscence published in the June 1997 American Conchologist (p. 18) in honor of the COA 1997 convention on Captiva. A bit of confusion resulted it its being filed away with another manuscript by Dick, already published. With apology to Dick for our unconscionable lateness, we offer:

More on Junonia

by Richard Petit

A year ago, in *American Conchologist* 25(2) there was an interesting article by Peter Dance on the appearance of *Scaphella junonia* on an Audubon plate. Dance speculated as to whether or not Sitwell (1949) may have been the first to notice this occurrence.

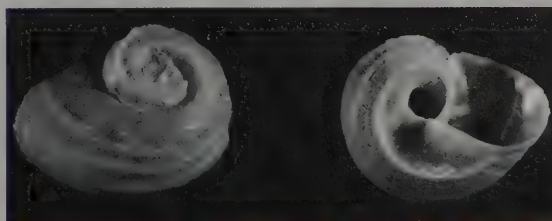
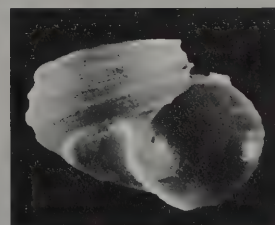
In 1913 W.G. Mazzyck published his *Catalog of Mollusca of South Carolina*. Therein, on page 10, he stated: "...the very rare *Scaphella junonia*...is in the Ravenel collection now in the Charleston Museum. Dr. Ravenel told me in 1868 or 1869 that his Sullivan's Island specimen had been drawn by Audubon on one of the plates of our shore birds for his great work on the birds of North America. A recent search for this figure has located it on plate CCCIX in company with *Sterna*

havelli Aud., one of our local gulls."

Mr. Al Sanders of the Charleston Museum has confirmed (pers. Comm., July 1997) that the Ravenel Collection in the Charleston Museum contains two specimens labeled "Sullivan's Island" bearing the catalog number ChM-R699.

WHAT IS IT?

by Kevan Sunderland



Cyclostremiscus sp? 5 mm. Dredged in 80 fathoms, off N coast of Colombia.

CONCHATENATIONS

The Pilsbry Award

by Gary Rosenberg

In a previous column, I announced the availability of the Pilsbry Award, which recognizes exhibits at shell shows that present original discoveries and ideas about mollusks. The Malacology Department at the Academy of Natural Sciences of Philadelphia presents the award to encourage collectors to make their own observations of and hypotheses about mollusks, to try to prove or disprove accepted wisdom, and, perhaps, to proceed to publication. The award is named for Henry A. Pilsbry, long-time curator of mollusks at the Academy who named more than 5,000 species and genera of marine, land, freshwater and fossil mollusks. Winners of the Pilsbry Award will receive a crystal vase engraved with images of *Latiaxis pilsbryi*. Currently the Pilsbry Award is available only at the Philadelphia Shell Show, held in November of each year.

There has been some confusion about what exhibitors are expected to do to win the Pilsbry Award, particularly because previous announcements referred to a requirement for "original research". "Research" meant "discovery" rather than "study." Many shell exhibits require a large amount of research (study), in the sense of reading and synthesizing a lot of information, but the exhibitor was not the person who discovered the information. The Pilsbry Award seeks to recognize those who make discoveries, who create knowledge. To further make expectations explicit, I present the following information.

Rules and Guidelines for the Pilsbry Award

- 1.) The show must be open to the public.
- 2.) No restrictions may be placed on the club or regional affiliation of exhibitors.
- 3.) The show should follow the recommendations for sound judging process issued by the Conchologists of America.
- 4.) One or more of the judges for the show must have published at least three papers on mollusks in refereed scientific journals.
- 5.) Judging is to an absolute standard. No award shall be given if the judges deem that no exhibit fulfills the standards of the award; multiple awards may be given if more than one exhibit meets the standards.
- 6.) The Pilsbry Award emphasizes scientific merit, rather than beauty, scope, or educational value per se, so an exhibit need not win a blue ribbon in its class to be eligible.
- 7.) An exhibit can win the Pilsbry award only once.
- 8.) An exhibit can win both the Pilsbry Award and another major award at the same show, subject to the other award's rules.
- 9.) Borrowed shells may be used if the source of the specimens is acknowledged in the exhibit. (Note: this may prohibit entry in other classes in some shows.)
- 10.) Professional malacologists are not eligible for the Pilsbry Award. Shell dealers are eligible.

Standards

In addition to being well-organized, neat and visually appealing, exhibits should

- a.) contain significant new, unpublished knowledge about mollusks,
- b.) go beyond mere observation,
- c.) present well-reasoned arguments distinguishing facts from assumptions and assertions,
- d.) credit information derived from existing literature,
- e.) present enough descriptive, comparative, or graphic material to let viewers decide whether they agree with the conclusions,
- f.) follow the standard format described below.

Format

Exhibits competing for the Pilsbry Award should follow the same format normally used in science fair exhibits and in scientific publications:

- **Abstract** (optional): Summary of the entire study, including the conclusions.
- **Introduction**: Objectives of the study, with enough background information to put them in context.
- **Materials and Methods**: How the study was performed, stated in sufficient detail that someone could replicate the study.
- **Results**: Presentation of the factual results of the study, e.g., observations, measurements, graphs.
- **Discussion**: Interpretation of the results and their significance, particularly in relation to previous studies by other workers.
- **Conclusions**: Summary of important findings of the study. Note that negative conclusions can be just as important as positive ones.
- **Acknowledgments** (optional): Names of those who helped, including photographic credits.
- **Bibliography**: Published works cited in the exhibit's text.

Examples

Several years ago, Scott Johnson, Jeanette Johnson and Stan Jazwinski showed that Colubraria suck fluid from sleeping fish. The observations were put into context by discussing other mollusks known to parasitize fish (some cancellariids and marginellids), and by using them to explain lack of a radula in some Colubraria. Other possibilities are documenting changes in a local fauna, or catching two forms of a species hatching from a single egg case (proving that they are synonyms), or showing that two forms of a species live in different habitats (which might show that they are different species, or that environment influences morphology).

Mere presentation of pictures of previously unknown live animals is not sufficient to win a Pilsbry Award; the pictures must be the basis for some conclusion. For example, Richard Salisbury used external anatomy and shell features to show that *Vexillum tuberosum* is really a mitrid closely related to *Pterygia pudica* rather than a costellariid related to *Vexillum patriarchalis* as previously thought.

Presenting evidence for a new species in an exhibit might be a tough sell, since it is very difficult to prove that all the relevant literature has been examined. Exhibitors should try for projects that can be judged mainly by what is put into them, rather than by what might have been left out.

Guidance

Since more than one Pilsbry Award can be given at a show, exhibitors are not competing against each other, but against an absolute standard. Therefore, it is fair for people to get comments on their ideas before putting a lot of effort into developing exhibits. Those aiming for the Pilsbry Award may contact me (or another professional malacologist) for advice. I can't guarantee that an exhibitor will win first time around, but I can help point people in the right direction.

The Pilsbry Award: an 11" high etched crystal vase adorned with images of *Latiaxis* (at right).



Sea Turtle Facts

- The first ten years of a sea turtle's life, the "lost years," are spent floating in the ocean currents. No one knows where they go or what they do during this time.
- Turtles are reptiles and so must surface to breathe.
- Female sea turtles must be 40-50 years old before they lay eggs. They return to the beach where they were hatched, or as near as possible to that beach.
- Sand temperature covering the egg determines the sex of the turtle. 26C sand hatches males, while at 31C female hatchlings predominate. — *Townsville Tidewatch*

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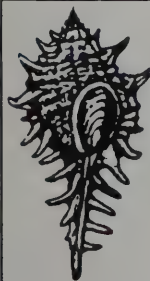
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THE 1998 COA MID-YEAR BOARD MEETING



The 1998 COA Mid-Year Board Meeting in Houston, March 28: Front row from left: Linda Koestel, Past President; Lynn Scheu, Editor; Donald Dan, Awards Director. Middle Row: Dave Green, President, Amy Edwards, Lambis Group Liaison; Bobbie Houchin, Treasurer; Jean Roe, Secretary; Linda Brunner, Vice-President. Back Row: Lucille Green, Membership Director; Ruth Ann Sparlin, Parliamentarian; Rosalie Taylor, Trustee; Jim Brunner, Finance Director; Dr. Gary Rosenberg, Grants Director; and Betty Lipe, Publications Director (Photo by Rosalie Taylor)

PUBLICATION ANNOUNCEMENT:

Mollusca: The Southern Synthesis, Fauna of Australia Volume 5. Published by Australian Biological Resources Study and CSIRO PUBLISHING Jan 1998, 1250 pp, 2 Volumes, colour illust, Hardback ISBN 0 643 05756 0 A\$295.00

Mollusca: The Southern Synthesis is the most comprehensive and authoritative treatment yet of Australia's marine, freshwater and terrestrial molluscs. It is a significant international reference, with contributions from 70 authors, and in which some 7,700 papers in the primary literature are cited. Most molluscan families described in the book are also found in the Northern Hemisphere, making this title an essential reference for malacologists worldwide.

Mollusca: The Southern Synthesis provides a series of overviews at one or more levels for the phylum and six classes, introducing accounts for the 423 molluscan families presently recognised in the region. At each level, details are presented on: morphology and physiology; natural history; biogeography and phylogeny; history of discovery; and economic significance.

There is also a comprehensive coverage of the fossil record. The glossary will assist readers less familiar with special terms, and the 30,000 entries in the comprehensive index will ensure ready access to information in the text and figures.

Readership: This volume is aimed at professional and amateur malacologists and a broad non-specialist readership, including ecologists, biologists, palaeontologists, conservationists, land managers and tertiary students.

We hope to publish a review of this important work in September. We have seen the book and can report that it is a magnificent reference. — Ed.

Captions for photos on following page.

Top: *Mitra semiferruginea* Reeve, 1845 From under dead coral in 30 feet of water, West End, Bahamas Photo by Charlotte Lloyd

More on *Cymatium armatum* (Sowerby, 1837)

by Thora Whitehead

The interest aroused by Russ Webb's live find of this species in Fiji led me to wonder how many specimens of this elusive *Cymatium* have been reported from Queensland waters to date.

The first was a 36 mm dead taken juvenile, given to me by Nina Pope of Port Douglas, just before I moved to Brisbane in 1972. It was collected by her husband Ross "On a reef north of Port Douglas." My efforts to identify it were an ongoing failure until the publication of Walter Cernohorsky's *Tropical Pacific Marine Shells* in 1978.

Writing in the *Tide Watch* of June 1995, Glenda Rowse of the Townsville Shell Club recalls seeing a *Cymatium armatum* in the collection of Eric Beltrame at Ingham (south of Townsville) in 1978, said to be "from a local reef."

While visiting the Townsville Shell Show in 1985, I saw the first live taken *C. armatum* brought in for identification by an unknown diver. The shell had been found in 40 feet, under a ledge at night, in the vicinity of Slashers Reef. A beautiful specimen, it was photographed, and was the focus of so much interest that the diver became even more attached to his shell than he had been on arrival and, in spite of several offers, he left with it.

It was a long wait until the next find of *C. armatum*, by Lyn Blakey in 1994, at Boulton Reef in the Bunker Group off Gladstone. After rough weather, this reef abounds with crabbed shells which have been thrown up from deeper water. Lucky Lyn found two dead specimens of *C. armatum*, but not being a "ranellid person," subsequently parted with both: one of 70 mm to Glenda Rowse and the other to a Cairns collector.

In *Tidewatch* of December, 1995, Glenda reported three more taken by a diver at Flinders Reef off Townsville. Two were taken alive.

In September, 1995, the annual charter trip of the Brisbane Group of the Malacological Society of Australia visited the Capricorn/Bunker group. As I made my way onto Boulton Reef, only one species was on my mind — *C. armatum*! But after 4.5 hours of searching in vain, I became diverted by other finds, particularly *Bursa*, and had almost forgotten my "mission." Coming to a very large and unturnable rock, I inspected the "crabbies" on the top and around the base, and, as a last thought, I moved a small rock leaning against the larger one. There, lying aperture up, was a chunky brown shell. First thought: "What *Bursa* is that?" followed by the joyful realization that I had found the one shell I had wanted most of all to find, a dead *C. armatum*, 70 mm and in good condition, an adult specimen for my collection at last.

This brings a total of nine specimens of *C. armatum* recorded from Queensland so far. All have been collected from the Great Barrier Reef. Of these, only three were live taken, and all by divers. The species appears to live along the entire length of the Great Barrier Reef, wherever suitable habitat occurs. Nothing is surer than that there will be occasional finds of this elusive ranellid in future, both here and in areas along its wider range in the West Pacific.

And Another U.S. Specimen...

Peter Stimpson also has a *Cymatium armatum* in his collection. Pictured on Bill Frank's Jacksonville Shell Club Home Page on the internet <<http://home.sprynet.com/sprynet/wfrank/jacksonv.htm>>, the shell is an 80.7 mm specimen, certainly the largest specimen known to date. Pete's shell was taken in 1997 by diver at night on coral at a depth of 12 meters on the north side of New Caledonia.

Bottom: *Hemitoma octoradiata* (Gmelin, 1791) This common rock dweller was collected just below the tide line. Tobago, British West Indies. Photo by Charlotte Lloyd



The Second Australian National Shell Show:

Sydney

by Patty Jansen

photos by Karen Wadwell

The scenario could hardly have been much worse. It had been pouring rain all day on Good Friday. Many roads and houses were flooded, electricity and phone lines cut and people left stranded. And on Saturday morning it was still raining when we started to make our way to the Manly Beach venue for the Sydney Shell Show. I began to wonder who on earth would want to visit a shell show on a day like this. But by the time we got there, the rain had eased to a slight drizzle, and patches of blue sky were showing. Maybe it wasn't going to be such a bad day after all.

The Manly Pacific Hotel wasn't just another shell show venue. It was fabulous. The convention hall was beautifully set up, with rows of tables with neat white tablecloths. Hotel staff were everywhere to help. Through the windows on one side you could see the surfers on Manly Beach. Even at seven o'clock, the hall was buzzing with activity. Everyone was setting up exhibits and tables, and there were people from all over the country, all over the world as a matter of fact.

Keith and Glenda Rowse had come down from Townsville, Barbara Collins and Tas Weinreich from Cairns, John Singleton and the shell dealers Kim Back and Hugh Morrison from Western Australia. There were many more. I met many people I had only ever corresponded with, and I guess we could have had a Conch-L meeting. Stephanie Clark was there, and Lynton Stevens, and Simone Morrison, and I found myself setting up next to Don Pisor.

Saturday morning was reserved for judging; the general public was allowed in at lunchtime. Then it very quickly got busy! A program of talks on Saturday afternoon included a talk by author and marine conservation activist Neville Coleman about the Ovulidae. Other speakers were Winston Ponder from the Australian Museum about landsnail conservation, Val Darkin from Russia about shell collecting in the former USSR, Annette Whitney from Mackay about shell collecting after a cyclone, and myself about the Internet.

Unfortunately, I did not attend the dinner on Saturday night, but I

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The Name of the Game

by Bill Bailey

The traditional objectivity of scientific writing sometimes leads scientists to inject a little of their personality into their nomenclature. Thus nuclear physicists measure not in nuclear cross sections but in barns ("as easy to hit as..."), and some chemistry students I used to know referred to any sugar they couldn't identify as "godnose" or "whonose". Zoological taxonomy provides a rich field, starting with the amoeba, *Chaos chaos* L., as Richard Coniff has found (*Smithsonian*, December 1996). Naming a beetle *Agrava* presumably relieved some frustration the animal had caused, while arachnophobia emerges in the name *Draculoides bramstokeri*. But what amorous, if fickle, musings resulted in bugs being named *Peggichisme*, *Polychisme* and *Dolichisme*? Most of these "Sounds-like" names are deliberate (e.g., the intellectual fly *Phthiria relativitiae*) but *Dyaria* is a lepidopterist's unfortunate tribute to H.G. Dyar.

Among molluscs, Coniff mentions an unbelievable snail *Ba humbugi*, and the superheroic squid, *Batoteuthis*. In *The Shell Makers*, Alan Solem names may commemorate a resemblance — the ballerina-like muricid *Typhina pavlova*, or the circumstances of discovery — the clam *Ascitellina urinatoria* washed from "dredged mud in the scuppers of a small boat near the end of a long day at sea." For pinpoint accuracy it is hard to beat the name of the tiny snail *Punctum pygmaeum*, which resembles a ... Does this species rattle around in its genus, or share it with an as-yet undescribed ?? Or even a !!

—Reprinted from the *Bulletin of the Malacological Society of London*, February, 1997

believe it was a very joyous occasion.

Sunday was a more informal day. A buy-sell-swap session was held for non-dealer collectors and a number of books were auctioned. A copy of the *Compendium of Seashells* fetched \$86! We also had the official book launch of *Bivalves of Australia Vol. 2* by Kevin Lamprell and John Healy, an occasion for which the publisher had travelled from Europe. Both authors were also there.

It was so busy I hardly got to look at the displays, but there was some great material! In all, there were 141 entries in 44 sections, including all the major collectible families, landsnails, education, shell craft and photography. "Shell of the Show" was won by Martin Hiscock with a specimen of *Harpa goodwini*. Prizes were generally well-distributed over the field of entrants, but Barbara Collins from Cairns managed to win four first prizes, Milton Church and Michael Keats each won three first prizes, and 'junior' Conch-L member Lynton Stevens from Melbourne won two first prizes, taking out the Cypraeidae and Strombidae sections.

After a meeting was held to determine the location of the third National Shell Show, it was announced that it would be held in Adelaide, South Australia in February 2000. Mark your diaries! The Brisbane club has expressed interest in hosting the fourth National Shell Show.

A great time was had by all and many thanks are due to the organising committee and members of the Sydney Shell Club: Michael Keats, Lady Io Myers, Ron Moylan, Chris Barnes and Karen Wadwell, Des Beechey, Ashley Miskelly, Adrian Browne and David and Elizabeth Woodhouse. They managed to stage this great event, they got the sponsorship to hold the show at this most impressive venue, they promoted the show in many places. There was a kid's colouring in competition in the local newspaper, handouts of leaflets at the ferry wharf, brochures at service stations, and much more. The show also managed to attract visitors from what some shellers see as the other side of the fence: environmental activists and agencies. It was great to see them there.

I did not notice anyone packing up early; we all had too great a time. For me, it was back to normal life when way from the other side of the hall came an almighty squeal: 'Mummy!' and a waist-high blur of pink dresses and blond hair came running through the crowd. We all had a great weekend. See you in Adelaide in February 2000!

Gentlemen and Players

The Malacological Society of London, Conchological Society of Great Britain and Ireland, the Linnnean Society and the Society for the History of Natural History jointly attended a conference last fall on the historic roles of amateurs and professionals in British malacology, 1900-1950, as reported in the *Bulletin of the Malacological Society of London* (February, 1998). Professor Robert Cameron (U. of Sheffield) introduced the meeting saying that it would raise questions about the future of malacology because undergraduates learn less about particular groups, and the skills and knowledge may become concentrated in the hands of amateurs. Various speakers described the invaluable contributions of pioneers in malacology, most of them amateurs, and the conclusion was drawn that conservation has given natural history a new purpose, but amateurs need focussed projects, as shown by the role of amateurs in ornithology in vegetation mapping schemes and the solution of the migration mystery by their collective activities.

It's #1

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Landshell Periostracum

by Richard Goldberg

From my observation and experience with land shells, both in the field and in preparation for collections, almost all terrestrial and tree dwelling mollusks have some sort of periostracum. The only exceptions to this are the calciphile species such as the limestone dwelling operculates, and similar species.

Land shell periostracum can be a thin, transparent or translucent covering, or an opaque and tinted covering that envelops the entire shell. In the case of many *Helicostyla* and related genera, the periostracum forms an intricate pattern that, from the collector's point of view, adds an aesthetic quality to the shell. This patterned periostracum is sometimes referred to as cuticle. Unfortunately, as we know, bleach will remove all types of periostracum. And many land shells, especially the commercially collected shells, are batch bleached, removing any hint of periostracum. Many of the ground-dwelling terrestrial mollusks have a thin, or thick chitinous-like periostracum that in some species tends to become flaky and peel off over time. I personally find the periostracum an important characteristic of the shell. In a few cases, it can also help aid in the identification of the species.

The thin, transparent or translucent periostracum of many species does tend to intensify the color of the shell underneath. The *Amphidromus* species in the subgenus *Syndromus*, and one species in particular, *A. (S.) inconstans*, have a base shell color of bright yellow (see the cover of the June 1997 issue of *American Conchologist*). With the periostracum intact, the yellow color is deep yellow — almost approaching a yellow/orange in fresh specimens. When the periostracum is bleached off, the yellow color becomes extremely light, almost yellow/white. The yellow pigment is in the shell, but the perio-

stracum adds a tint that deepens the color; almost like holding an amber colored photographic filter to your eye and viewing a yellow object. This intensification of color is exhibited with most of the *Syndromus* species. In the case of *A. inconstans*, both the light and dark tints are aesthetically pleasing, so it is personal choice whether you keep the periostracum intact.

Removing the periostracum in some species can also cause another problem. For instance, the large *Megalobulimus* of South America have a thin, but tough ochre/amber colored periostracum which adds a sheen to the surface of the shell. When bleached, some of the *Megalobulimus* shells become dull and chalky, as does *M. oblongus*. The periostracum-less shells of other *Megalobulimus*, *M. terrestris* for instance, are shiny, so it really makes no difference whether you remove the periostracum, other than in the tint of the shell.

On the other hand, if you bleach a species like *Asperitas everetti*, the large, dark green Ariophantid from Flores Island, you will be sorry. What you will be left with is a drab, mauve colored shell with virtually no resemblance to the fresh shell with periostracum.

It would be next to impossible to list every land species to indicate whether bleaching would be a benefit or detriment to the shell. My suggestion is not to bleach any land shell when at all possible. In fact, the small thin-shelled species may dissolve if dunked in bleach.

Use a soft toothbrush and mild soap to brush away exterior dirt and debris. If the periostracum seems to obscure shell color underneath, then it is personal choice whether you remove it or not. As previously mentioned in this thread, an option would be to display one with and one without periostracum. But that often is not an option. The rule of thumb is, if the shell has color, don't bother bleaching; if the shell is drab and looks like it would benefit from cleaning, then use the toothbrush and mild soap route. Nine times out of ten you will be glad you did.

—Written for *Conch-L* 1/4/98

Mid-Atlantic Malacologists, Report of First Annual Meeting

by Tim Pearce

Yes ma'm! The meeting was on the east coast of North America, not in the middle of the Atlantic Ocean.

The first meeting of the Mid-Atlantic Malacologists (MAM) was held 28 February 1998 at the Delaware Museum of Natural History in Wilmington, Delaware. The 30 participants at the one-day gathering included professional, amateur and student malacologists, shell collectors and dealers, and people from government and non-profit organizations interested in conservation and regulatory issues. People came from Delaware, Maryland, New Jersey, and Pennsylvania, the farthest travel being from Pittsburg. Interests of participants spanned the major Molluscan groups: gastropods, bivalves, and cephalopods. Because MAM was only one day long, even busy malacologists were able to attend.

The 8 lively talks (see below) generated much discussion, and the many conversations throughout showed that this meeting was successful in allowing local malacologists to connect with each other. After the meeting 13 participants took the opportunity to examine specimens in the extensive malacological research collection at DMNH. Enormous thanks are due to staff and volunteers at DMNH, to members of the Wilmington Shell Club for their help, and to all the participants.

MAM is patterned after the long-successful Bay Area Malacologists (BAM) meeting started in the San Francisco area more than 25 years ago by Gene Coan. George Kennedy started the Southern

California Unified Malacologists (SCUM) meeting in San Diego in 1997. Now with MAM such an annual meeting is available to East Coast malacologists. The informal nature of MAM is evident in the lack of dues, officers, abstracts, or publications. Since future meetings can rotate among institutions, persons wishing to host MAM in future years should contact Tim Pearce.

For additional information about MAM, contact: Timothy A. Pearce, Curator of Mollusks, Delaware Museum of Natural History, Box 3937, Wilmington, DE 19807, U.S.A., phone (302) 658-9111; fax (302) 658-2610, email: tpearce@delmnh.org.

Talks presented at the Mid-Atlantic Malacologists meeting 28 Feb. 1998:

- Tim Pearce - Survey of Land Snails of the Delmarva Peninsula
- Betty Jean Piech - *Cheilea* secretes a basal plate as in Hipponicidae
- Bob Prezant - Thermal impact on brood potential of the freshwater snail *Campeloma*
- Gary Rosenberg - Color in Mollusks
- Jim McCann - Conserving Maryland's Freshwater Mussel Fauna
- Tom Grace - Variation in the *Conus cardinalis* complex
- Randy A. Cirulino - Regulating the ranching of non-native snails
- Rich Goldberg - *Amphidromus* land snails on Timor, Indonesia, field notes on shell variability.

Additional Participants at MAM 98: Jeff & Belinda Beck, Harry & Lillian Berryman, Dave Brinker, Al Chadwick, Phil Dietz, Judy Goldberg, Jim Gossweiler, Linda Grace, Geoff Halfpenny, Caryl Hesterman, Sue Hobbs, Russell Jensen, Victor S. Kennedy, Rich Kirk, Elaine McDonald, Ken Piech, Happy Robertson, Liz Shea, Charlie Sturm, John Wolff.



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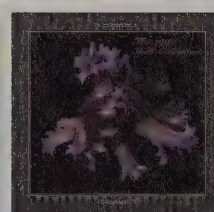
The Shell Desk Diary celebrates its 40th anniversary. And in celebration we're introducing a companion piece — The 1999 Shell Wall Calendar.



We're 40 — and Glad of It!
To celebrate — the 1999 Shell Desk Diary will feature photos of specimen shells from the new exhibit at the Houston Museum of Natural Science.

Among the treasures is the world's largest known snail shell, a *Syrinx aruanus*, or Australian Trumpet, that's more than 30 inches long. The Diary, with its 32 pages of full color photography, will focus not only on shells, but also on the fascinating animals that inhabit them.

You will find the 1999 Shell Desk Diary a wonderful way to enjoy the new year — all year. Be sure to order several for gifts.



**Introducing the
Shell Wall Calendar
for 1999.**

The inaugural edition of the Shell Wall Calendar celebrates the beauty of nature — by land and by sea — as

photographed by internationally published photographer, Lynn Funkhouser. Lynn's stunning photos contrasts the softness of flowers with the texture of shells in twelve images that captures the meaning of each month. Measuring 12 1/2" x 12", the pictures are captioned and suitable for framing.

If you like shells — and pretty pictures — you will love this calendar.

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Overheard on Conch-L:

Bob Granda of Panama City, Florida had this to say on pronunciation of scientific names to Jenny Scarboro Cline:

Dear Jenny,

You stated that when speaking to a professional malacologist you needed to sound like you knew what you were talking about and that you wanted your statements taken seriously. Also something about using good scientific pronunciation keeping you from making an impression as someone who either doesn't care, or doesn't know any better.

If ever there was a butcher of Latin, it's me. Used to worry about it. At a shell show I was talking with Tucker Abbott and I apologized about my horrible Latin pronunciation of a genus we were talking about. He looked at me and told me not to worry about it, that most collectors wouldn't pay much attention to the way I pronounced it. He then said he knew what I was talking about even if I didn't pronounce it like he did.

Tucker knew I cared and was serious about what we were talking about. It should be noted that I do make an effort to pronounce Latin names correctly. To bring this probably boring story to a conclusion, from that day on I figured that if the way I pronounced some Latin shell names was good enough for Tucker, it was good enough for everybody else.

Tim Pearce, Curator of Mollusks of the Delaware Museum made a plea for saving molluscan soft parts:

Dear Conch-L,

I'm glad to see recent discussion about saving molluscan soft parts...recent discussions on Conch-L indicate that a tremendous number of live mollusks, with good locality data, are dying, but their soft parts are being discarded....For my contribution, I want to propose a way that shell collectors who want to keep their shells can still contribute to malacology by donating the soft parts to the Delaware

Museum of Natural History (DMNH).

DMNH will be happy to accept donations of soft parts, of practically any mollusk species, that have been removed from the shells, as long as the specimens meet certain conditions. (1) The shell must be available for researchers to borrow, both now and in the future (for example, you could arrange to donate the shell to a museum when you are finished enjoying it). (2) Furthermore, you must keep good records so there will be no question about which shell goes with which soft parts. (3) Finally, the soft parts should be relatively intact and not rotten. If you can meet these conditions, please consider donating soft parts from your shells to DMNH.

Why must your shell be available to researchers? Even if you provide an identification, researchers want to verify the ID. Verification is important in science. Although non-scientists may think it rude to question someone's word, scientists frequently ask each other "How do you know?" or "Why do you think that?" Scientists need to be able to examine the evidence (e.g., the shell) and draw their own conclusions about the identity. The following heat-treatment method allows removal of soft parts from gastropod shells in a way that leaves the shell intact and the soft parts as intact as possible. Immerse the gastropod in water at 65 degrees Celsius (150 degrees Fahrenheit). That temperature will denature the protein in the columellar muscle enough that it will loosen from the columella. Then by holding the body with forceps, you should be able to "unscrew" the body out of the shell. This method works for many land snails; I suspect it will work for most marine and freshwater shells as well. What preservative? As has been mentioned, the desired preservative really depends on how the specimen will be used. Ethanol probably allows for the greatest number of potential uses, so if you are preserving specimens without a particular use in mind, 70% ethanol is a good choice.

Some people may have to change the way they collect shells if they want soft parts they collect to be useful to researchers. By using other methods besides rotting bodies out of the shell or exploding them in a microwave oven, you may be able to make a contribution to malacology. For further information about donating soft parts to DMNH, please contact me.

-Tim

LETTERS

I have watched with interest and concern the discussions [on Conch-L] over the past couple of years regarding restriction of collecting in various parts of the world. I just read *A Passion for Birds: American Ornithology After Audubon* (Mark V. Barrow, Jr., Princeton Univ. Pr., 1998) which I want to recommend to anyone interested in the future of conchological collecting. It appears that the conchological world is almost exactly a century behind the ornithological one in facing the question of restricting collecting. The parallels are amazing, right down to the scientists blaming the commercial trade for declining populations. Fortunately, I have not seen the schism developing between amateurs and professionals that developed in the ornithological world. Even our own Walter F. Webb "moved into other, less contentious areas of natural history, like shells or books" (p. 139) when collection restrictions threatened his egg and bird-skin business. I am not certain whether there are lessons for conchologists to learn, or whether it is a chronicle of the future of our own hobby, but I recommend the book to your readers.

Bruce Neville
2105 Lakeview Road SW
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bneville@unm.edu

NOTED CONE AUTHORITY DIES

by Gene Evérson

Marcel Pin, the well-known shell dealer from Dakar, Senegal, died April 18, 1998. Suffering acute emphysema, he was hospitalized where he experienced a heart attack. After several days he returned home where his emphysema worsened. Enroute back to the hospital he succumbed to another heart attack.

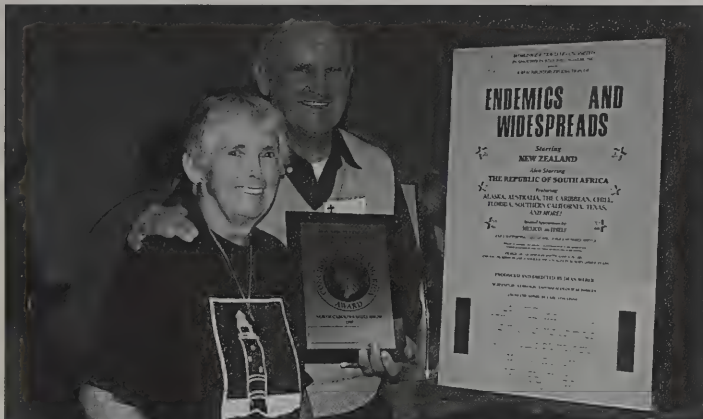
I was in Dakar at the time, along with three other collectors, on a shelling trip that Marcel had arranged. He selected our ininterary, paid deposits for our "motels," and even had dive weights made for us since none were available for rent. His death affected us personally and he will also be missed by his many friends around the world.

The Cones of Senegal, published as a supplement to *La Conchiglia* 277, December 1995, which was authored by Marcel Pin, remains the definitive work on the cone shells of West Africa.

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COA TROPHY WINNERS

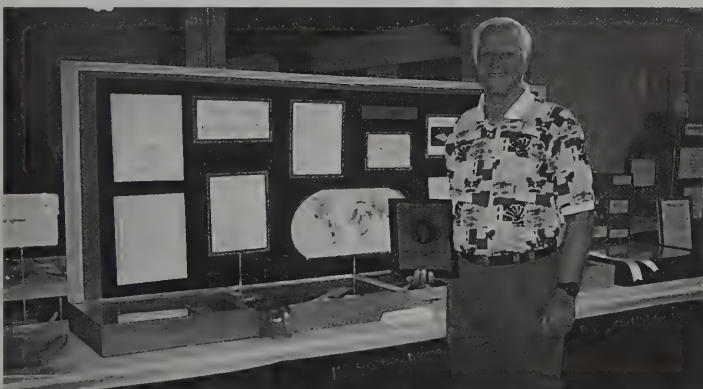
Edited by Charlotte Lloyd



Our congratulations go to Dorothy and Dean Weber for their winning exhibit, "Endemics and Widespreads." The COA Trophy was presented to them at the North Carolina Shell Show on Nov. 21-23, 1997. The shells, all beach collected by the exhibitors, explored the occurrence of mollusks from around the world and included text, habitats and places of origin. This exhibit is presently being displayed by the Museum of Coastal Carolina at Ocean Isle Beach, N.C.



Lynda Zylman Jacaruso, shell collector extraordinaire, captured the COA Award with "Shells of Tobago" at the Astronaut Trail Shell Show on January 17-18. This outstanding exhibit also brought her the Self-Collected World-Wide trophy for *Pholadomya candida*. Good job, Lynda!



"Genus *Fusinus* Rafinesque - The Spindle Shells" was presented by Bud Rogers at the Marco Island Shell Show held March 12-14 of this year. Bud was captivated by a single spindle shell from off the coast of St. Vincent, and assembled a reference collection to help him with identification. This collection of *Fusinus* earned him the COA Award. Nice work, Bud!

At right, Stanley Francis was the happy winner of the COA Trophy at the British Shell Collectors' Club Shell Show last October 25th. His lovely exhibit, pictured here, was entitled, "British Shells Can Be Colorful Too."



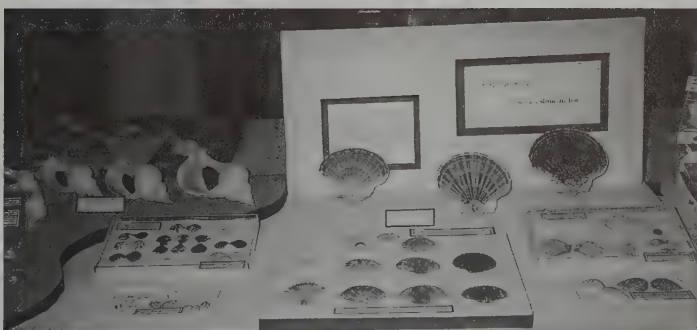
COA member Craig Caddigan won his COA trophy at the greater Miami Shell Show held Jan. 20-21 of this year. The five cases of "Genus *Harpa*" included range maps, identification keys, history, habitat, diet, and models showing the live animal. This exceptional exhibit also received the G.M.S.C. President's Award.



At the November, 1997 Philadelphia Shell Show, Marilyn Lucarelli wowed everyone again with her beautiful exhibit of "Muricidae: The Genus *Murexiella*." Marilyn used her skill with a camera to capture the sculpture of these gems, and also included taxonomy, type species, distribution, genus history and descriptions in this award winning exhibit.



Three thousand three hundred visitors attended the Broward Shell Show this year and viewed the exhibit that won the coveted COA Trophy. And who was that winner, you ask? Why, it was the team of Bob and Alice Pace, who handsomely presented 12 cases of "Landsnails of the Philippines." Competition was keen, as this popular show attracted over 410 feet of scientific displays. Congratulations to the Paces.





Strombus guthriei Linne, 1758
This Rooster Tail Conch peeks
at us from beneath its shell,
taken on sand in 80', Bequia,
West Indies.
Photo by Charlotte Lloyd

AMERICAN CONCHOLOGIST

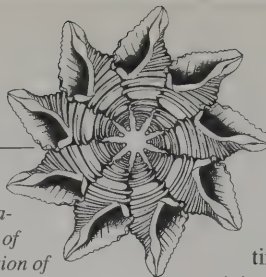
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VOL. 26, NO. 3

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In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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PRESIDENT'S MESSAGE

Thank you to the Central Florida Shell Club for all the hours you spent to make "Discover the Magic" a magical time for all who attended. We had many attendees who were participating in their first convention and, because of your hard work, they will be back. I look forward to seeing the faithful, as well as more new members, in Louisville.

Thank you to the membership for your vote of confidence in electing the new board. We will strive to meet your needs and to bring the organization forward to meet the year 2000.

COA is composed of three basic types of members; the collector, the dealer, and the scientist/author. All are interrelated. None can stand alone.

The collector braves the weather, travels to distant shores, keeps records of habitat, and catalogues his finds. He shares what he finds with other collectors and with dealers, and consults scientists when he finds an unusual specimen or unusual conditions. He buys the books the scientist/author writes, thus perpetuating their relationship. If his find is a new species, the scientist is able to study the find and publish an account. Then the dealer has a new product to sell or trade.

The scientist often does his own field work but, in this day of declining educational budgets, he often consults a collector in the area for information. He may also ask collectors if they have observed a specimen in an area before he journeys to search for the shell. The scientist may consult a dealer for information about shells the dealer has bought to sell. Where did he get them? What information came with them?

The dealer sells shells. Where does he get his shells? He buys or trades for his shells with collectors. He may even be a collector himself. Who does he rely on for identification? The scientist/author, of course. If the dealer misidentifies a shell he may lose credibility and or business. If he has nothing to sell, he makes no money.

This triad has no hierarchy. The three sides are interdependent. If there is a problem in one area it will also affect the others. This is the way it has been for centuries and the way it must be as a new century unfolds.

Good shelling!

Linda Brunner



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HANK FOGLINO HAS THE NEW COA PINS IN STOCK!

COVER CREDITS: September's cover photo is the work of Dr. G. Thomas Watters of the Ohio State University Ohio Biological Survey. Tom photographed this lovely nudibranch at the Duke University Marine Lab at Beaufort, NC and hopes someone will tell him what it is. Whatever the species, it knows how to pose, and Tom is a very quick man with a camera.

Louisville 1999 – Your Kind of Place!

You are cordially invited — in fact, urged — to attend the 27th Annual COA Convention for a real change of pace and price. "Come home to Kentucky!" land of bluegrass, beautiful women, fast horses and great whiskey! It's a quieter pace here, with lovely hills and mountains, sleepy majestic rivers, and a thousand shades of green! Tradition and history are rich here, in this 15th state to enter the Union. Legends of Daniel Boone and Civil War heroes, moonshiners, and great horses combine with gracious Kentucky hospitality, world famous liquor and fine cuisine and crafts to lure visitors from all parts of the globe!

The 1999 COA Convention will be in Louisville, KY June 27 - July 1, with early registration on June 26, and field trips on July 2. Our convention hotel will be the Galt House, situated on the banks of the beautiful Ohio River. This historic hotel, the fourth hotel by that name, and a landmark in Louisville, will feature very reasonable accommodations: convention prices for rooms start at \$79.00 plus tax, and executive suites at \$89.00. The hotel provides free indoor parking for 3,200 cars and vans, has six restaurants and lounges and a Village Mall of shops, including a Berea Craft Shop where you can conveniently shop for those baskets and quilts for which Kentucky is famous. The hotel commands a majestic view of the mighty Ohio, nearly a mile wide at this point, with three riverboats and a cruise boat docking at the landing just below. Lovely bridges, a river fountain ten stories tall, and an idyllic view of the Indiana shore will be your view from a variety of vantage points and from many of the rooms in the Galt House's two towers.

Our convention has been in Florida for three years straight, and it is time for a change of geography, a change of climate, a change of pace. Why Louisville? It is conveniently located within one day's drive of over 60% of the nation's population. This is one of the reasons why UPS is headquartered there. Louisville has more restaurants, per capita, than any other city in America. In addition to the three hotel restaurants, there are 22 eateries within a three block area. The Toonerville Trolley stops at the hotel every 6-12 minutes, depending on the route. It provides free transportation throughout downtown for access to more restaurants and shopping, including the Galleria, our downtown shopping mall. So your stay in Louisville is sure to be comfortable, convenient and relaxed.

Here are some more reasons to make Louisville your vacation destination for 1999: The Galt House is across the street from the Kentucky Center for the Arts and Actors Theater, home of the Humana Festival of New American Plays. It is a short walk to the IMAX Theater, within the Louisville Science Center. Nearby is the Louisville Slugger Museum and Bat Factory — The Louisville Slugger is the world's most famous baseball bat, and the museum is one of the top 10 industrial tours in the country. Louisville is home of Churchill Downs and The Kentucky Derby, the most famous horse race in the world. A museum and film are devoted to helping you explore the lore and legends of horse racing.

Do you need convincing? More Devonian Age fossils have been named from the Falls of the Ohio here at Louisville than from anywhere else on Earth. Our only field trip DURING the convention will take you across the Ohio to visit this area and its unique Interpretive Center. We have a great zoo which features a new Islands Exhibit,

highlighting endangered habitats and species. Opening this month is an African exhibit, Boma, with native huts constructed and thatched by African craftsmen.

Louisville is home of Muhammad Ali, the world's most famous boxer. It is the home of the *American Conchologist*. And it is home to Supersheller, one of the world's most famous shell collectors. And Louisville is Home of the Cheeseburger (Kaelin's Restaurant, 1934).

Still more reasons to plan for Louisville 1999: We will hold a Shell Derby, only the second competitive shell show that COA has ever sponsored. We have the capacity to host the largest COA Bourse ever.

The Galt House is located at the convergence of three interstate highways. Why not plan a very special summer vacation around the COA convention? Consider: I-65 takes you north to Indianapolis in 2:15, where the historic Brickyard hosts the Indianapolis 500, the nation's most famous auto race, and another 2:30 gets you to Chicago. I-65, heading south for 1:30, will take you to Mammoth Cave, the world's most famous cave and one of the Seven Natural Wonders of the World. Another 1:30 is Nashville and the Grand Old Opry. I-64 can take you west to St. Louis and its famous Arch, zoo and botanical garden. Or it can take you east to Frankfort and the nearby historic Shaker Village and on to Lexington, famed for its beautiful, rolling, bluegrass horse country and its elegant, historic estates and homes. From Lexington it is another easy and scenic drive south to Knoxville, Dollywood, Gatlinburg and the Smoky Mountains National Park. I-71 begins in Louisville and takes you to Cincinnati in 1:15 for major league baseball, the world famous Cincinnati Zoo and the immense King's Island Amusement Park. (Speaking of amusement parks, Louisville's own Kentucky Kingdom Amusement Park features over 110 rides, including several top ranked roller coasters, and it boasts a low admission price.)

If you did not attend this year's convention in Orlando, talk to someone who did. Convention Chairman Gene Everson's slide program previewing the '99 convention was so very compelling that it convinced all who saw it that Louisville is the place you want to be next year. Louisville - Your Kind Of Place! For more information about the convention, write or call Gene Everson, 500 Nottingham Pkwy, Louisville, KY 40222-5026. Phone 502-429-5788. Email c/o Lynn Scheu <amconch@ix.netcom.com>

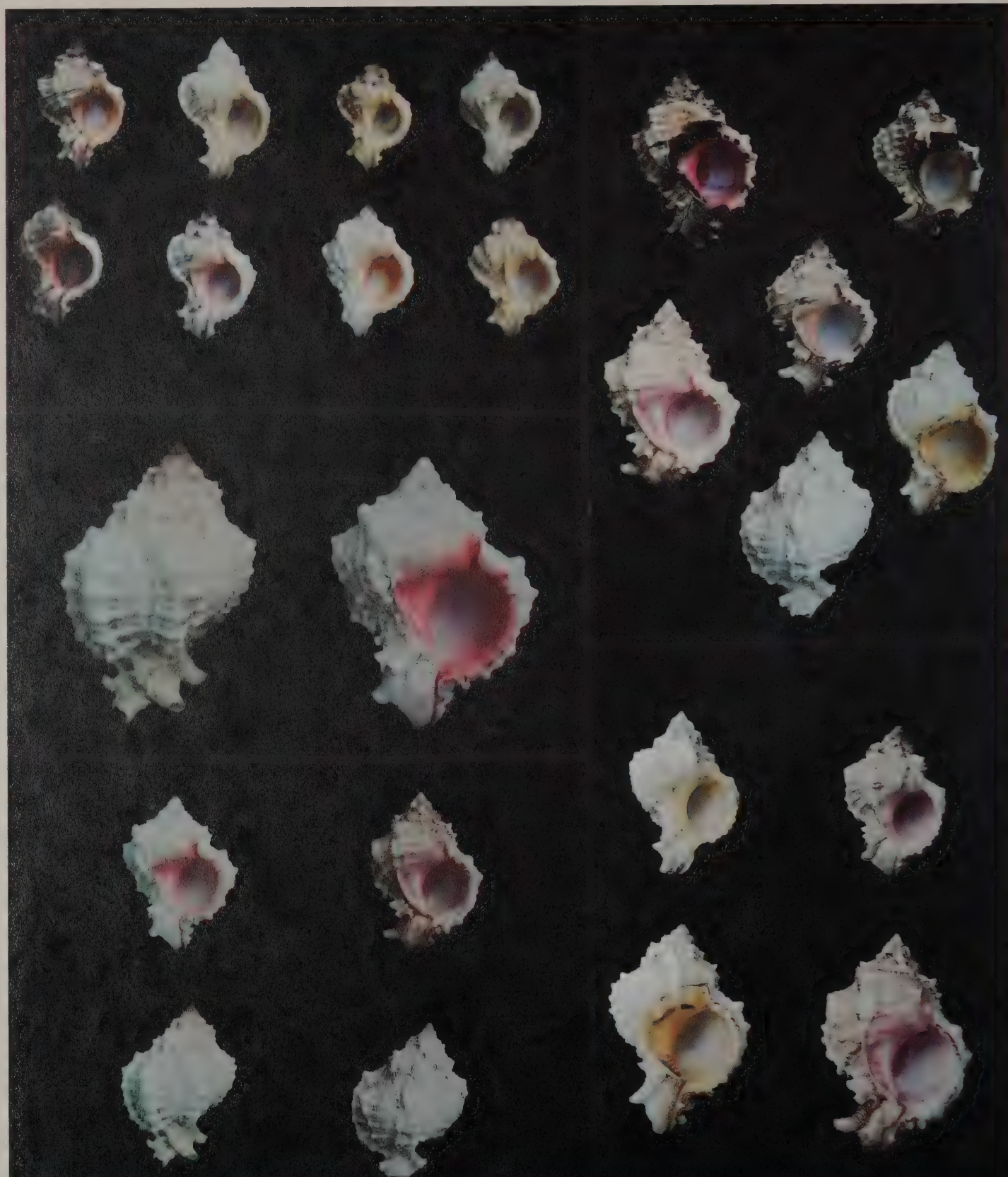


First Call for Papers

COA is looking for presentations for the 1999 convention in Louisville, Kentucky. Presentations should be conchologically informative (no pure travelogues, please), well illustrated, and of general interest. Presentations should be 20-30 minutes in length, including time for questions. Please mail a brief abstract/description (no email or phone calls, please) of the presentation to the following address:

Tom Watters
Ohio Biological Survey
Ohio State University
1315 Kinnear Road
Columbus, OH 43212 USA

COA HAS A NEW PIN!



Top left: *Phyllonotus margaritensis* from Amuay Bay, showing color variation. Top right: *Phyllonotus margaritensis* from La Isleta, Isla Margarita (four-varixed form), showing color variation. Center left: *Phyllonotus margaritensis* from Macanao Peninsula, Isla Margarita (five-varixed form). Lower left: *Phyllonotus margaritensis*, comparison of five-varixed (left) and four-varixed (right) forms, Isla Margarita. Lower right: Size comparison of *Phyllonotus margaritensis* from Isla Margarita (top) and Amuay Bay (bottom).

THE MYSTERY OF MUREX MARGARITENSIS ABBOTT, 1958

By Emily H. Vokes, Tulane University (Emerita)

Our story begins in 1831, when William Swainson figured a beautiful shell with an orange aperture, which he named *Murex imperialis* (*Zoological Illustrations*, vol. 2, pl. 67). Two years later he proposed the subgeneric name *Phyllonotus* in a table accompanying volume 3 of the *Zoological Illustrations*, plate 100, with no species being named. But on plate 109 of the same work he figured another specimen, very similar to *Murex imperialis* but with a pink aperture. This second figure he called *Murex (Phyllonotus) imperialis* variety *a*, noting that the variety differed in the color of the aperture. Thus *Murex (Phyllonotus) imperialis* var. *a* became the type of *Phyllonotus*.

There are a couple of small problems here. For one, the difference in the color of the aperture is not a specific character and so *Murex imperialis* var. *a* is a synonym of *M. imperialis*, which becomes the type of *Phyllonotus* by default. But the name *Murex imperialis* had been used previously by Fischer von Waldheim in 1807. This difficulty was resolved by R.T. Abbott, who in 1958 (*Acad. Nat. Sci. Phila.*, Mon. 11, p. 61), renamed the preoccupied *M. imperialis* as *Murex margaritensis*, for Isla Margarita, Venezuela, as this is the principal locality for the occurrence of this species. In this area the shell is a rather massive, low-spined form with four or five heavy varices.

All was well and good for about 20 years until a number of very strange specimens of *Phyllonotus* began to be collected along the northwestern coast of Venezuela (from the Guajira Peninsula to the Paraguaná Peninsula). These shells were smaller and seemed more delicate than the usual ones from farther east and they looked an awful lot like the Pliocene *Phyllonotus globosus* (Emmons, 1858) common in the shell beds of the southeastern U.S. from North Carolina to Florida, as well as assorted other localities, including the Esmeraldas beds of Ecuador. These Recent specimens were subsequently identified by various authors (Petuch, 1976, 1987, 1988; Fair, 1976; Kaicher, 1979; Vokes, 1990) as *Phyllonotus globosus*.

I have discussed this problem at some length (Vokes, 1990, p. 67-69) and noted that separating Recent specimens of *P. globosus* and *P. margaritensis* is not only difficult but ambiguous, with the shells of *P. globosus* being smaller and lighter, with three or four varices per whorl and usually two intervarical nodes between each pair of varices. The varices are ornamented occasionally by small open spines, but more commonly only with high raised ridges where the spiral cords cross.



Phyllonotus pomum (left) and *Phyllonotus margaritensis* (right).

Department of Geology, Tulane University, New Orleans, LA 70118-5698

The shells I assigned to *P. margaritensis* are more massive, with four varices in the early stages and one single large intervarical node between each pair; then in the adult stage the varices and nodes merge, forming five varices without any nodes between them.

However, I concluded that the two forms do occur together (even in the fossil record of northern Venezuela) and I wondered if *P. margaritensis* is just an extremely variable species with three, four, or five varices, and heavy or light shells. Could there be some ecologic reason for the differences seen? My pragmatic decision was to consider those delicate shells with three or four varices as *P. globosus* and the heavy ones with four or five varices as *P. margaritensis*, until I had more data.

Well! Now I have more data and it would be nice to be able to say that everything is all cleared up. The additional data comes from a collecting trip to the north coast of Venezuela led by Emilio García, undertaken in June, 1998. Our first destination was Amuay Bay, on the west side of the Paraguaná Peninsula, primarily for the purpose of collecting *Cypraea mus*, which is common there and occurs almost nowhere else. But the first thing we saw when we arrived there was not *C. mus* but monstrous piles, absolute ziggurats, of muricids!

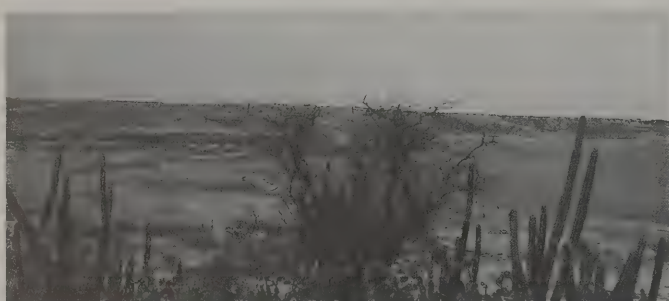
These shell mounds are the result of the local populace removing the meat and dumping the only partially empty shells in the garbage. Fortunately, the wind always blows at about 40 mph, so the smell and the flies are not a serious problem. These piles contain numerous examples of *Chicoreus brevifrons* (plus assorted other species, such as *Melongena melongena*), but are predominantly *Phyllonotus*, the form thought to be *globosus*. The shells are all relatively small, maximum size about 3 inches (75 mm) in length, with seven teleoconch whorls. All have four varices and, although the young specimens do have two intervarical nodes, the adults have but one such node, which tends to merge with the last varix. The varices are not spinose but are ornamented by strong cords where the spirals cross. Aperture colors range from pale yellow or pink to dark orange.

Subsequently, on Isla Margarita, we had the opportunity to examine lots of "real" *P. margaritensis*, again from the same smelly type of shell dumps found at Amuay Bay. But here a funny thing occurs. On the eastern side of the island, for example at La Isleta, just south of Porlamar, across the bay from the airport, every one of hundreds of examples had four varices. The shells are larger than those at Amuay, with the average adult size (seven teleoconch whorls) about 4 inches (100 mm). Aperture colors include the usual yellow, pink, and orange, but here perhaps fifty percent also have the striking brown margin to the aperture and brown spiral stripes we associate with *P. pomum* (see Radwin and D'Attilio, 1976, pl. 16, fig. 6; specimen from Porlamar).

Traveling farther west maybe 25 km from La Isleta we found the first examples of the five-varixed form, with a ratio of about 50/50 four- to five-varixed shells. This ratio continues all the way around the Macanao Peninsula (the western half of Isla Margarita). The size is about the same as the La Isleta examples, as is the coloration, except that there are far fewer of the "pomum-type" brown apertures to be found.

As I look at all these shells, it would seem to me that along the coast of Venezuela there are three populations. The easternmost one (eastern Isla Margarita) has large shells, always with four varices, and a strong tendency to brown apertural margins. To the far west (Amuay Bay) there is a population of smaller shells, also with four varices, but only rarely brown-rimmed apertures (I have seen a couple). Then, in between, primarily on the Macanao Peninsula, there is a population that develops five varices.

Logic dictates that there are ecologic factors at work, even though we do not know what they are. For example, at Amuay Bay *Cypraea mus* is abundant — but it does not occur anywhere around Isla Margarita (or anywhere else, for that matter). What is it about Amuay Bay that is unique? Is that what causes the shells of *Phyllonotus* to be

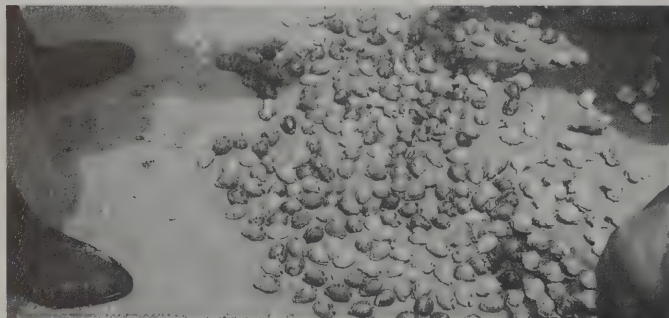


Overview of Amuay Bay, west side of Paraguaná Peninsula, Venezuela.

smaller? Because, I must confess that, except for the smaller size, I cannot separate them from the Margarita specimens. They really are not more delicate — a juvenile example from Isla Margarita (with six whorls), the same length as one from Amuay, is much lighter in weight. Proportionally, the Amuay shells are just as heavy as the Margarita ones.

Geologically speaking, I still believe that *P. globosus* is the mother of them all, including the two West Coast species, *P. erythrostomus* (Swainson) and *P. regius* (Swainson), which demonstrate their very close relationship by means of a small "genetic quirk," a strange twist to the upper spine on the siphonal canal that is confined to the three species. Interestingly, the most obvious difference between the two West Coast species is the color of the aperture — always pink in *P. erythrostomus* and always blotched with brown in *P. regius*. So, although ultraviolet light shows that the aperture of *P. globosus* was monochromatic, this genetic possibility must have been present as far back as the Early Pliocene, when *P. globosus* made its way to the Pacific (via the Gatun Formation in Panama to the Imperial Formation in California and Esmeraldas Formation in Ecuador) to give rise to the two younger species.

At the same time the line must have made its way to northern South America, where *P. margaritensis* diverged. As noted in earlier papers (Vokes, 1967, 1990), in the Late Pliocene/Early Pleistocene Cumana Formation exposed near Isla Margarita there are numerous examples of *P. margaritensis* with five or six varices (as well as one beat-up



Cypraea mus at Amuay Bay.

specimen with four varices that I thought was *P. globosus* but which I now assume is just a four-varixed *margaritensis*). Perhaps there has been a tendency to reduce the number of varices through time, for I have seen no Recent example with six varices. We may be seeing in the *globosus-margaritensis* complex the same problem of parallelism seen in the *Haustellum chrysostoma-H. messorius* complex, where the

two species start out in the Pliocene as easily distinguished forms but through time become increasingly similar, so that today it is often difficult to separate them. Just coincidentally, the *chrysostoma-messorius* problem occurs in exactly the same geographic area as the *globosus-margaritensis* complex. I might add that this is the same area where we find *Haustellum hamanni* (Myers and Hertz), which is the only species of *Haustellum* with four or five varices. Is there something in the water there?

In conclusion, after having looked at hundreds of examples of *Phyllonotus* from the northern coast of Venezuela, I think they are all the same species, for which the name to be used is *P. margaritensis*. However, I would be the first to admit that if someone mixed some sun-bleached Venezuelan specimens with a bunch of Pliocene *P. globosus* I doubt if anyone would notice. Sure, the five-varixed ones are easy but the only difference with the four-varixed ones is that *P. globosus* is lighter in weight (at the same size), and more elongated, and the varices are usually ornamented with small open spines. But given the degree of variation seen in the Recent shells, who would quibble!

The next question that rears its ugly head is, if the specimens have a yellow aperture blotched with brown, and brown stripes on the body whorl — how do you tell them from *P. pomum*? And once again the answer is, with great difficulty. *Phyllonotus pomum* extends south along the Central American coast as far as Panama, and south into the Lesser Antilles to northern Brazil, so it would be only logical that the species occurs off Venezuela as well. I saw no examples of *P. pomum* at any of the localities we collected along the coast of Venezuela but I have seen dredged material from nearby with three varices, but with pink or yellow apertures (no brown blotches). I am assuming that any Recent Atlantic *Phyllonotus* with three varices is *P. pomum* and that the latter are just strange examples (maybe hybrids?). In addition to the three varices, the shell in *P. pomum* is not as broad as in *P. margaritensis*, and consequently the inductura is not as expanded. But this is not invariable; Pliocene specimens from the Dominican Republic, with three varices, which I figured as *P. pomum* (Vokes, 1990, pl. 10, fig. 7) have the same low-spined broad outline as *P. margaritensis* (compare Vokes, 1990, pl. 10, fig. 9).

So we see that even with more data the problem is far from solved. However, in the interest of sanity, I recommend that we decide that all Recent Atlantic specimens of *Phyllonotus* with four or five varices be called *P. margaritensis* and those with three be called *P. pomum* (unless they are *P. oculatus*, which may be distinguished from *P. pomum* by the multi-whorled protoconch). The name *P. globosus* would be applied only to fossil examples with elongate shells, such as those in Florida (see Vokes, 1967, pl. 4, figs. 1-3; pl. 5, figs. 1-3) and the examples from the Gatun Formation of Panama (Vokes, 1990, pl. 10, fig. 6).



Author, having died, goes to heaven.

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"EASY BEANS AND COCONUTS"

The Cay Sal Cruise, 11-18 July 1998

By Lieutenant Jenny R. S. Cline



Cay Sal lighthouse stands as a lonely sentinel. (Photo by Charlotte Lloyd)

Back in early 1998, Howard Roux and Karlynn Morgan, both of Naples, Florida, and members of the Broward Shell Club, dreamed up an idea to shell the reefs and scattered keys of the Cay Sal Bank. Wanting to share the fun, Howard made arrangements to charter a boat and began recruiting for a weeklong trip of diving and snorkeling designed especially for shellers. Over the course of the next few months, news of the upcoming trip spread by word of mouth and CONCH-L. Soon all 12 berths were reserved for a diverse and lively bunch: Ann Buddenhagen (North Carolina), Charlotte Lloyd (Florida), Kevin Smith (California), Ken Piech and his 14-year old daughter Sherri (Delaware), John Chesler (Florida), Lee and Mary Bukstel (Florida), Wayne Harland (Florida), Karlynn Morgan (Florida), myself (Texas), and Howard.

The vessel, chartered through Gold Coast Charters of Riviera Beach, Florida, was the 65' foot *M/V Shearwater*, offering a comfortable and effortless ride with 19' of beam and a top speed of 20 kts. To our delight as we boarded the boat on the 11th of July, we discovered that not only was the good ship air-conditioned, but it had TWO heads with warm showers, as well as an onboard watermaker and air compressor for extended trips. The living area belowdecks featured three cabins with two bunks apiece, and an open living area with six bunks.

The Cay Sal Bank lies on the southwest reaches of the Bahamas, about 65 miles southeast of the Florida Keys. It is a ring of reefs, shoals, and scattered cays some 60 miles in diameter. Only one of the tiny outer cays is inhabited; there, a small band of Bahamians mine aragonite, the pure sand used to make Waterford Crystal. The Bank is unreachable other than by boat, or in the case of ironmen like Ken Piech, by swimming.

The Good Ship *Shearwater* set forth at 2:45 p.m. on 11 July from West Palm Beach, passing within stone's throw of my favorite childhood shelling spot, Peanut Island. We set out in a 15-20 knot west wind for Bimini, roughly nine hours distant across the Gulf Stream. We were to check in with Customs the next day and then run for Cay Sal after making a few dives off Bimini.

Most of our group were seasoned ocean boaters, but those of us who weren't endured a miserable ride to Cay Sal. The steady west wind piled up 6-8' swells that rocked even the sturdy 65' *Shearwater* with nauseating force. After screaming at submarines for two days, I

became a big fan of Meclizine and ventured my first steps on a new pair of "sea legs." Things had started to look a bit grim for the trip until the winds calmed on the third day and the seas returned to their seasonal stillness.

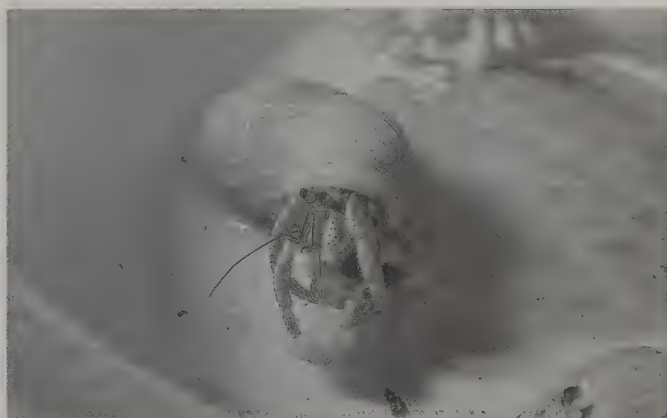
Our itinerary offered a diverse array of diving venues, while the dives were limited only by one's personal stamina and dive computer. The hardcore among us made up to six dives a day and we all began pulling up delightful shells. Kevin Smith, one of the younger passengers and a former member of the Broward club, was dubbed "Supersheller" for his uncanny ability to ferret out underwater hidey-holes where the most sought-after prizes dwelt.

Some of the best finds of the trip went to Howard Roux (*Pterotyphis pinnatus* Broderip, 1833), to Charlotte Lloyd (*Conus richardbinghami* Petuch, 1992), and to the eagle-eyed Bukstels, who surfaced with *Muricopsis zylmanae* Petuch, 1992. Unfortunately for our muricophile John Chesler, *M. zylmanae* stubbornly eluded his searches. True to form, however, Supersheller Kevin Smith recovered the finest *M. zylmanae* specimen – a huge gem with optimal spination, glorious ruddy color, and minimal encrustation.

Junior sheller Sherri Piech hauled up three enormous *Xenophora conchyliphora* (Born, 1780) in a single dive. Karlynn Morgan recovered a *Cymatium aquatile* Reeve, 1844, which looked like a world record; unfortunately it had a chipped siphon and fell just short at 110mm. Conehead Wayne Harland found cones aplenty, including the really unusual and lovely *Conus arangoi* Sarasua, 1977 and *Conus richardbinghami* Petuch, 1992. As a *Cypraea* specialist, I was on the hunt for cowries, but my best finds turned out to be *Mitra semiferruginea* Reeve, 1845, *Prunum roosevelti* (Bartsch & Rehder, 1938), and *Turbo cailletii* Fischer & Bernardi, 1856.

The Blue Holes of Cay Sal, on the second day, proved as eerily mysterious as reputed. Created by the ancient collapse of underwater limestone caverns, these holes range in depth from a hundred to more than a thousand feet, providing a haven for sharks and pelagic fish. As we floated over the edge and gazed into the abyssal blue, it was hard to fathom what might lie below. Ken Piech lowered a trap cage to 270 feet but when it was recovered a day later, nothing had entered to investigate the bait.

At Water Cay on Day Three, several of us went ashore to look for landshells. John Chesler came back with one gem that was inconveniently occupied by a hermit crab. Deciding not to terminate the creature immediately, John and Charlotte Lloyd offered the little crab a new lease on life if it would only abandon its desired shell. But after spending several days in a bowl on the dinner table, the charismatic crab acquired a nickname ("Kay") and charmed us into adopting it as our trip mascot. Kay now enjoys life in a custom-made glass penthouse, courtesy of Charlotte, and is well cared-for by the crew of the *Shearwater*.



Trip mascot "Kay" before her move to the penthouse. (Photo by Charlotte Lloyd)

565 Sherwood Ave, Satellite Beach, Florida 32937.

Lieutenant Jenny Cline is an Army officer serving in the 1st Cavalry Division at Fort Hood, Texas. She has been collecting since 1981, specializing in Cypraeidae with a strong interest in self-collection and research techniques. She recently married Rob Cline, a PADI dive instructor presently teaching SCUBA in the British Virgin Islands. In November 1998 she is leaving for a year in Honduras where she plans to dive and collect extensively. Cay Sal was her first liveaboard dive trip.



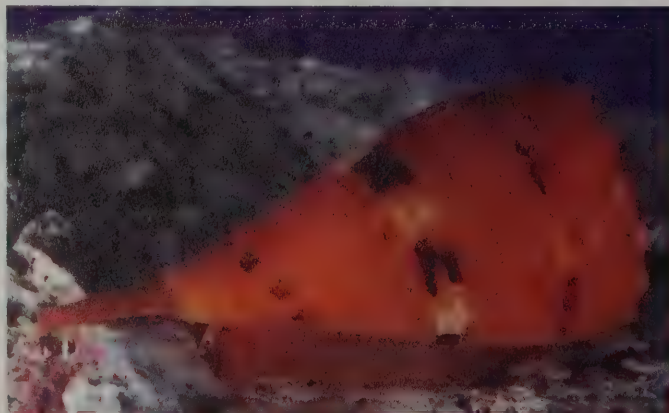
Kevin's beautiful *Muricopsis zylmanae* which he plucked from the wall deep within a reef cave. (Photo by Charlotte Lloyd)

On the fourth day, we worked our way from Water Cay to Elbow Cay. We anchored not far from a rock outcropping where our most agile youngsters scrambled repeatedly up the 35' face to take a refreshing watery plunge. Again the adventurous went ashore, this time to investigate a ruined lighthouse. Returning with rusty bolts and ancient glass as souvenirs, our explorers reported that they were not the first to set foot on the cay since its abandonment.

Some stoned soul had spray-painted the inside of the lighthouse, in large letters, with "EASY BEANS AND COCONUTS." What could this mean? We hadn't seen any coconuts, and other than the whiff of last night's dinner, no sign of beans. Yet the mystic slogan seemed to fit our lazy, strange trip to island after tiny island in search of those elusive Mollusca.

Speaking of dinner, no retelling of our tale would be complete without mention of the food. Randy the deckhand and our Captain John, spearfisher extraordinaire, supplied 90% of our cuisine straight from the depths. Oh, heavenly seafood! We ate forbidden fruits of the sea and some not so forbidden, all expertly prepared in a most wholesome way by our crew cooks, Julie and her assistant LeAnn. Talk fresh! Gastropods aside, the trip was a gastronome's delight.

Making our way south, we anchored over the wreck of the *Rampidas*, which lies in 15' of water among scattered coral heads and sand. The current was fairly strong but the shelling was worthwhile. Among the abundant *Cyphoma* here, John Chesler found a second example of a strange *Cyphoma* variant. Superficially the shell matched



Conus arangoi collected at night on reef at 65' by Wayne Harland. (Photo by Charlotte Lloyd)

Cyphoma gibbosum (Linné, 1758) but the animal was pale with densely clustered, jet-black, irregular blotches. It was nothing at all similar to the rhomboidal pattern of *C. gibbosum*, and was probably not a freak, given that Ken Piech found an identical juvenile specimen in a separate locality.

A most enchanting dive was 40-60' at night off Orange Key, which boasted rich marine life. I carefully approached a great stingray of 4' wingspan; the ray allowed me to stroke its velvety hide for a few moments, then lazily it glided away into the darkness. Hardly touched by human use, the ledge reefs glowed with vibrant health, as the surrounding sands crawled with night feeders like *Conus flavescens* Sowerby, 1834, *Conus jaspideus* Gmelin 1791, Olividae, Naticidae, and Marginellidae.

One day we were snorkeling off a nameless little key to pass a few hours offgassing before our next series of dives. We found nothing interesting, other than the wreck that a hurricane had beached years past. When we had returned aboard, a casual headcount was taken, then we pulled anchor and headed for a key several miles away. Life continued on the *Shearwater* very much as it normally would: some of us sleeping, some eating, some diving, but none of us in the same place at the same time. So it wouldn't seem odd to not see someone for several hours.



John Chesler's mystery *Cyphoma* variant from the near the *Rampidas*. (Photo by Charlotte Lloyd)

Meanwhile, upstairs in the wheelhouse, a call came through on the radio: would *Shearwater* please return to get their passenger they'd left behind? What? But we were all here — who could they mean? The reply: some guy named "Kent." Oh dear...No one, not even his daughter, could remember seeing Ken Piech since we went snorkeling earlier in the day — a few hours, several miles, and a dive or two earlier.

The crew raced on deck and *Shearwater* hauled fanny back to the little trio of keys we'd been snorkeling that morning. A guilty group of us gathered on deck as the boat approached the island where the mining operation was running. We watched a little pale man dive into the water and start swimming vigorously for the boat as we waited in the shallows.

As Ken pulled himself indignantly into the boat, he quipped drolly, "If you didn't like my jokes, why didn't you just tell me?!" Laughs, group hugs, and apologies followed. Ken recounted how after anxious minutes of waiting for us to return, he took his fate into his own hands and plunged into the sea to swim to the inhabited island, about a mile distant.

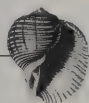
Gauging the formidable current running between the keys, Ken had begun to swim out at an angle that would sweep him toward the island rather than past it, but he recalled that in the last 500 yards, he feared that the current might run away with him. He fought harder, finally dragging himself onto the sandy shore, where several curious Bahamians greeted this bedraggled castaway. They had called us on their radio when he shared his plight. Thus we dubbed Ken Piech, who swam over a mile in stiff current, the Ironman of Cay Sal, and gave thanks for luck in what otherwise might have been an unthinkable incident.

Easy beans and coconuts, screaming at submarines, a hermit crab mascot, an elfin ironman, a funky lighthouse, good company, delectable food, and most of all, great shelling – all these things came together for one memorable week spent diving the reefs of Cay Sal. Many thanks to Howard Roux for putting the trip together, and to our freespirted, funloving crew of the *Shearwater* – John, Randy, Julie, and LeAnn – for an “immersive” experience!

Species Found on Cay Sal Bank, July 1998:

[Thanks to John Chesler for sharing his preliminary list.]

FISSURELLIDAE: *Lucapina aegis* (Reeve, 1850); *Lucapina suffusa* (Reeve, 1850); *Diodora viridula* (Lamarck, 1822); *Diodora dysoni* (Reeve, 1850); *Diodora minuta* (Lamarck, 1822); *Diodora jaumei* Aguayo & Rehder, 1936.
 TROCHIDAE: *Tegula fasciata* (Born, 1778); *Calliostoma jujubinum* (Gmelin, 1791); *Calliostoma javanicum* (Gmelin, 1791); *Cittarium pica* (Linné, 1758)
 TURBINIDAE: *Turbo caillietii* Fischer & Bernardi, 1856; *Turbo castanea* Gmelin, 1791; *Astraea tecta americana* (Gmelin, 1791); *Astraea phoebia* Roeding, 1798; *Astraea caelata* (Gmelin, 1791)
 CYCLOSTREMATIDAE: *Arene cruentata* (Muhlfeld, 1829); *Arene tricarinata* (Stearns, 1872)
 NERITIDAE: *Nerita peloronta* Linné, 1758; *Nerita versicolor* Gmelin, 1791
 LITTORINIDAE: *Littorina ziczac* (Gmelin, 1791)
 RISSOINIDAE: *Rissoina princeps* C. B. Adams, 1850; *Rissoina multicostata* (C. B. Adams, 1850)
 CERITHIIDAE: *Cerithium eburneum* Bruguiere, 1792; *Cerithium litteratum* (Born, 1778)
 TRIPHORIDAE: *Triphora ornata* (Deshayes, 1832); *Triphora turrithomae* (Holten, 1802)
 MODULIDAE: *Modulus modiolus* (Linné, 1758)
 XENOPHORIDAE: *Xenophora conchyliophora* (Born, 1780)
 STROMBIDAE: *Strombus gigas* Linné, 1758; *Strombus gallus* Linné, 1758; *Strombus raninus* Gmelin, 1791; *Strombus costatus* Gmelin, 1791
 ERATOIDAE: *Trivia nix* (Schilder, 1922); *Trivia pediculus* (Linné, 1758); *Trivia pediculus pullata* Sowerby, 1870; *Trivia quadripunctata* (Gray, 1827); *Trivia pacei* Petuch, 1987
 CYPRAEIDAE: *Luria cinerea* Gmelin, 1791; *Erosaria spurca acicularis* Gmelin, 1791; *Macropyraea zebra* Linné, 1758;
 OVULIDAE: *Cyphoma gibbosum* (Linné, 1758); *Cyphoma* species (unident.); *Simnia acicularis* (Lamarck, 1810)
 NATICIDAE: *Polinices lacteus* (Guilding, 1834); *Natica canrena* (Linné, 1758)
 TONNIDAE: *Tonna maculosa* (Dillwyn, 1817)



CASSIDAE: *Cypraea cassis testiculus* Linné, 1758; *Cassis flammea* (Linné, 1758); *Cassis tuberosa* (Linné, 1758); *Morum oniscus* (Linné, 1767); *Casmaria ponderosa atlantica* Clench, 1944
 CYMATIIDAE: *Cymatium femorale* (Linné, 1758); *Cymatium pileare* (Linné, 1758); *Cymatium aquatile* Reeve, 1844; *Cymatium rubeculum occidentale* Clench & Turner, 1947; *Cymatium labiosum* (Wood, 1828); *Charonia variegata* (Lamarck, 1816)
 BURSIDAE: *Bursa thomae* (Orbigny, 1842); *Bursa corrugata* (Perry, 1811); *Bursa granularis cubaniana* (Orbigny, 1842)
 MURICIDAE: *Muricopsis zylmanae* Petuch, 1992; *Muricopsis oxytatus* (M. Smith, 1938); *Dermomurex pacei* Petuch, 1988; *Pteryotryphis pinnatus* (Broderip, 1833); *Muricopsis aldrigei* Nowell-Usticke, 1969; *Chicoreus florifer* Reeve, 1846; *Phyllonotus pomum* Gmelin, 1791; *Murexiella macgintyi* M. Smith, 1938; *Thais rustica* (Lamarck, 1822); *Thais deltoidea* (Lamarck, 1822); *Purpura patula* (Linné, 1758); *Ocenebra muricoides* (C. B. Adams, 1845)
 BUCCINIDAE: *Bailia parva* (C. B. Adams, 1850); *Engina turbinella* (Kiener 1835); *Antillophos adelus* (Schwengel, 1942)
 CORALLIOPHILIDAE: *Coralliophila caribaea* Abbott, 1958; *Coralliophila abbreviata* Lamarck, 1816; *Coralliophila aberrans* C. B. Adams, 1850
 COLUMBELLIDAE: *Columbella mercatoria* (Linné, 1758); *Zafrona idalina* (Duclos, 1840); *Zafrona pulchella* (Blainville, 1829); *Pyrene ovulata* (Lamarck, 1822)
 FASCIOLARIIDAE: *Fasciolaria tulipa* (Linné, 1758); *Leucozonia nassa* (Gmelin, 1791); *Leucozonia ocellata* (Gmelin, 1791); *Latirus brevicaudatus* Reeve, 1847; *Latirus nematus* Woodring, 1928; *Latirus cariniferus* Lamarck, 1822; *Latirus virginensis* Abbott, 1958; *Dolicholatirus cayohuesonicus* (Sowerby, 1878)
 NASSARIIDAE: *Nassarius antillarum* Orbigny, 1842
 OLIVIDAE: *Oliva reticularis* Lamarck, 1810; *Olivella monilifera* Reeve, 1850; *Olivella nivea* (Gmelin, 1791)
 TURBINELLIDAE: *Turbinella angulata* (Lightfoot, 1786)
 MITRIDAE: *Mitra semiferruginea* Reeve, 1845; *Mitra barbadensis* (Gmelin, 1791); *Mitra pallida* Nowell-Usticke, 1959; *Vexillum pulchella* Reeve, 1844; *Vexillum puella* (Reeve, 1845); *Vexillum variatum* Reeve, 1845; *Vexillum epiphanea* Rehder, 1943; *Vexillum histrio* Reeve, 1844; *Vexillum dermestinum* (Lamarck, 1811); *Vexillum gemmatum* (Sowerby, 1871)
 MARGINELLIDAE: *Prunum guttata* (Dillwyn, 1817); *Prunum carnea* (Storer, 1837); *Prunum roosevelti* (Bartsch & Rehder, 1938); *Hyalina avena* (Kiener, 1834); *Hyalina pallida* (Linné, 1758)
 VOLUTIDAE: *Enaeta cylleniformis* (Sowerby, 1844)
 CONIDAE: *Conus arangoi* Sarasua, 1977; *Conus sahlbergi* DaMotta & Harland, 1986; *Conus jaspideus* Gmelin, 1791; *Conus jaspideus verrucosus* Hwass, 1792; *Conus flavescens* Sowerby, 1834; *Conus mus* Hwass, 1792; *Conus regius* Gmelin, 1791; *Conus havanensis* Aguayo & Farfante, 1947; *Conus richardbinghami* Petuch, 1992. *Conus* species (unident.)
 TEREBRIDAE: *Terebra dislocata* (Say, 1822); *Terebra biminensis* Petuch, 1987
 TURRIDAE: *Splendrilla fuscata* (Reeve, 1845); *Pilsbryspira albocincta* C.B. Adams, 1845; *Tenaturris trilineata* C.B. Adams, 1845; *Drillia cydia* Bartsch, 1943
 PYRAMIDELLIDAE: *Pyramidella dolabrata* (Linné, 1758)

Reference for species listed: R.T. Abbott, 1974. *American Seashells*. Van Nostrand Reinhold, New York.

COA-WALTER SAGE FUNDS UPDATE

by Bobbie Houchin, COA Treasurer

After Walter Sage's death in July 1995, funds were put in place in his memory for grants to education. The current status of those funds is: COA-Walter Sage Fund #1 (the Contributions Fund) has \$4308.70. COA-Walter Sage Fund #2, containing the proceeds of sales from Walter's Shell Fabric Collection which his mother donated to COA, has \$10,057.67. To help the fund grow Linda Koestel and other members have graciously given their time to see that these fabrics are sold at the conventions and at other events. The final segment of this fabric collection will be sold at the June 1999 Louisville COA Convention.

COA administers both of these funds using guidelines that were put

in place by the COA Board of Directors. From these funds, a total of \$1,225.00 has been given in grants since 1996. Again this year the two funds have given a grant, this year in the amount of \$150.00 to an approved recipient, Fabio Moretzsohn. (See Grants Announcement on page 31 in this issue.) The total amount in the two Walter Sage funds is \$14,366.37.

If you would like to make a contribution, please make your check payable to COA and designate it for the Walter Sage Fund #1. Send to Bobbie Houchin, COA Treasurer, 2644 Kings Hwy, Louisville KY 40205-2649. Please remember at this time COA is a 501(c)(4) organization and contributions are not deductible from your income tax.

ORDER YOUR NEW COA PIN NOW!

MAGIC DISCOVERED

By Jean Roe, COA Secretary

"Discover the Magic" was the invitation issued to COA members by the Central Florida Shell Club. Come and experience the magic of Disney, the magic of shells, the magic of friendship. We discovered all of these things during the 27th annual COA Convention in Orlando, July 18-23.



The Registration crew. Joan Field and Grace Johns, look on while COA Treasurer Bobbi Houchin chats with Jan Burrage. Photo by John Parkhurst

The Hotel Royal Plaza is conveniently located within the confines of DisneyWorld, and quite a few of the members took advantage of this fact to bring along children and grandchildren. This was particularly true of the Texans, as I counted 12 younger family members, all planning trips to Epcot, Magic Kingdom, the new Animal Kingdom, or (my own favorite) Rainforest Cafe. It was a busy time for us all, but underlying it was the excitement of being together to talk about shells.

During pre-registration on Saturday afternoon, Phyllis Gray, Grace Johns, and their crew kept things moving along efficiently, inserting envelopes of events tickets into attractive tote bags. Ben and Josy Wiener again sold Raffle tickets for items to be announced at the Banquet. (How many years has it been, Josy?)

Convention Chairman Linda Koestel, wearing her "Merlin" hat, set the magic in motion when she waved her wand over about 250 registrants on Sunday morning. She came prepared with a list of one-liner jokes and sprinkled these liberally over us, as well. COA President Dave Green and CFSC President Ray Wichus gave words of welcome, COA Reps were recognized, and Sylvia Dominey began to call the first numbers for door prizes. COA Convention '98 was officially underway.

Carole Marshall started the programs with "What's the



From left: David Woodman, Richard Goldberg and Brian Hayes discover the magic at the COA Welcome Party. Photo by Chris Takahashi

Difference?," an informative review of look-alike pectens, with pointers for telling the difference. As a scallop collector, I always look forward to Carole's programs and scribble frantically in the dark to write down all the pointers. Hank Foglino followed with a witty and educational explanation of El Nino, a subject in all of our minds as we anxiously watched for rain to put out the wild fires that had plagued central Florida before our arrival. Now, instead of blaming El Nino, we can look at it as "doughnuts of air."

Another good program for taking notes was Bobbi Cordy's "Show Time." For newcomers to the shell show circuit, these tips should come in handy when Gene Everson stages the "Shell Derby" at COA '99 in Louisville." Using the Internet to Build a Global Encyclopedia of Mollusk Species" was the topic of Gary Rosenberg's program, which stressed the need for unity in compiling important data bases.

At the close of programs everyone rushed to the Silent Auction prepared by Dan Parrish and his assistants. These events brought in over \$2,000 during the first few days of the Convention.



A magician pulls a *Murex pecten* out of Chip Chippeaux' ear while Edie Chippeaux looks on in disbelief! Photo by John Parkhurst

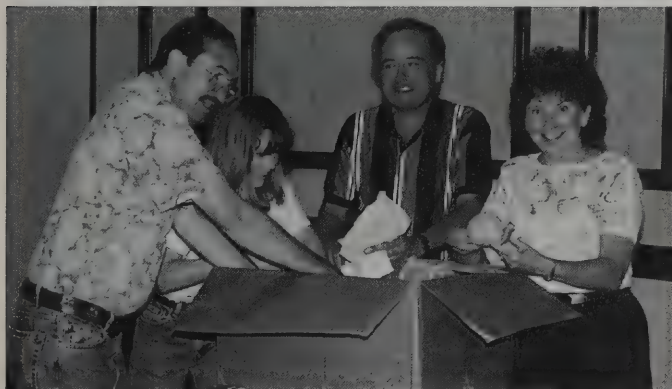
The magic extended to the Welcome Party Sunday evening. Food was outstanding and there was plenty of it. Strolling magicians and a mixer game called "Find the Person" kept things lively. . . lots of visiting, meeting new shellers, and hugging old friends. Susan and Howard Roux were showing off their beautiful new daughter Elizabeth, who was undoubtedly the youngest person there, but still could not qualify for the game category of "Person who has never flown in an airplane," since she came all the way from China to join her new family. The Coltro brothers had fun introducing new wives. As Jose said, "Now you can call us 'the old boys from Brasil.'"

Monday morning there was more Silent Auction along with brisk sales of the Walter Sage fabrics before programs started again at 9 a.m. More door prizes from Sylvia and photos by John Parkhurst, who seemed to be everywhere when needed.

Alice Monroe told us of "Seeing Shells in Another Light" as she showed slides of shells such as *Cypraea mappa* and *Acteona elioseae* and demonstrated how they fluoresce with black light. Then Helen Kwiat explained "Simple Techniques for Educating People about Shells." She enjoys giving programs for school children and showed methods for holding their interest. Her own cute new son found a willing baby sitter in Sue Hobbs, who strolled the halls with him while his mother attended to Convention duties. Harry Lee spoke of the "Nassariidae of the Western Atlantic," explaining the importance of the protoconch to identification.

After a lunch break, we were entranced with Chris Takahashi's slides of live shells in Hawaii. He frightened some of us, though, with his descriptions of deep dives. Alan Gittleman took us in the other direction, to Outer Space, when he described experiments with shells in studying calcium loss in shells in space.

At 2:30 p.m. on Monday the Annual Meeting was held. **Dave Green** thanked the COA for his two terms as president and presented plaques of appreciation to board members. **Dr. Gary Rosenberg** read the list of COA Educational Grants recipients. **Fabio Moretzsohn**, studying the *Cypraea cribraria* complex, will receive the Walter Sage Award for 1998. **Herb Young** read the slate of officers selected for 1998-1999 by the Nominating Committee: President, **Linda Brunner**; Vice President, **Betty Lipe**; Secretary, **Jean Roe**; Treasurer, **Bobbie Houchin**; and Trustee, **Howard Roux**. The slate was accepted by acclamation.



Dan and Amanda Parrish, Alan Gettleman and Toni Parrish unpack a box of shells to be set out for another round of Silent Auction. Photo by John Parkhurst

Gene Everson, who had managed to pin a Louisville Chamber of Commerce pin on nearly everyone present at the Convention, gave more information on the **1999 COA Convention in Louisville**. Even though there's no salt water nearby, there is no lack of things to see and do in Louisville.

The meeting ended just in time for those attending the Sleuth's Dinner Theater field trip to catch their bus. They reported a fun time. **Carole Marshall** was chosen to play a gypsy in the mystery.

Tuesday could probably be called the busiest day of the Convention, starting with the Club Reps breakfast, followed by morning programs. **Art Weil** was first, telling how to write a shell book. Art's quick wit is well-known and shows up in his new book, *How to Collect Shells*. Then **Betty and Bob Lipe** showed wonderful slides of living marginellas collected in Aruba and Grenada. Doug Jones spoke next on "Molluscan Photosymbiosis," a connection between algae and mollusks. The final program before the lunch break was **Amy Edwards'** "True Paper Snails" in which she described origami techniques to create paper snails, crabs and shrimp. **Shelly and Nick Zantop** were so intrigued with the directions she handed out that they started right then to create their own, while **Phyllis Diegel** and **Richard Duerr** looked on.



Co-auctioneer Al Deynzer urges bidding to new heights at the second most profitable auction in COA history. Photo by John Parkhurst



Don Pisor and John Bernard caught in the act....of unpacking shells for the bourse. Photo by Chris Takahashi

During the annual auction, it became apparent that **Dave and Lucille Green** had worked some magic of their own. As Dave and fellow auctioneer **Al Deynzer** auctioned the various items, the total mounted to over \$13,000. I saw many happy successful bidders, such as **Dean Woodard** with her *Conus gloriamaris*, **Mary Owen** carrying out a gorgeous *Conus milneedwardsi clytospira*, and **Sherlee Palladino** with an exquisite *Xenophora neozelandica kermadecensis* with tiny pink attachments. A successful auction such as this one assures the future of the Educational Grants Program, as well as the operation of the organization for the coming year, and the publication of *American Conchologist*.

Tuesday evening, continuing a tradition started last year, Conch-L members gathered to become acquainted face-to-face. Even those unable to come to the Convention had sent photos. Rosalie Taylor had prepared a list of all E-mail addresses for everyone.

Wednesday morning brought more of the Walter Sage fabric sales and COA sales with **Hank Foglino** selling back issues and the new COA pins. The new pins are really beautiful and sell for \$5. Or, if you're into "Collectibles," Hank will sell you the old pin for \$4.

Ross Mayhew had us laughing Wednesday morning as he told of shelling in the Canadian North, a country for the geologists among us. Ross used clever photography to present objects with no point of reference as to size.

A beautiful finale to the programs for 1998 was **Dave and Lucille Green's** "Sounds of Monterey Bay" with lovely slides set to music and the sounds of the bay around the Monterey Bay Aquarium. It gave us all a chance to relax a little before the frenzy of the Bourse began.

As usual, eager shoppers were waiting outside the doors for the Bourse to open. And the shopping continued on Thursday. In addition to some good shells, I also came away with a hydro-pick for cleaning shells, something I've had on my wish list for a long time.

The Banquet on Thursday evening was



Brian Briano in his bourse attire, a bright green skirt?! Brian, there must be a story behind this! Photo by Chris Takahashi

one of the best I've attended. **Joan Field** and her committee really did a grand job. The food was delicious, from the vichyssoise on through to the last bite of key lime pie; the "crystal ball" centerpieces complete with wizard were very clever; and the ceramic shell favors were so attractive that many of us purchased more.

In installation services **Dave Green** handed over the gavel to new President **Linda Brunner**. **Bob Granda** of the Gulf Coast Shell Club presented Linda with a bouquet of red roses. A fishy guest named "Marlin" crashed the party to entertain us with "punny" anecdotes. Guest speaker **Charles Opitz** told us about shell money and its purchasing power. He had brought along some fascinating examples from his collection.

There were some familiar faces we missed seeing this year, and sure enough, their names showed up among the Patrons. We missed you Clara, Barry, Mathilde, and Larry. Hope you can make it next year to the Galt House in Louisville. "It's your kind of place."



Paulo and Maria Fontina Angioy of La Conchiglia convince Barb Elliott that she needs another book instead of a shell. Photo by John Parkhurst



Marilyn Lucarelli, Wayne Harland and Charlotte Lloyd enjoy a little social time in the hotel cocktail lounge. Photo by Christ Takahashi



Your elected board for 1998-99: From Left, Vice President Betty Lipe, Trustee Howard Roux, President Linda Brunner, Treasurer Bobbie Houchin, Secretary Jean Roe, and Past President Dave Green. Photo by John Parkhurst

DONORS TO THE AUCTIONS AND RAFFLES

These, and the avid bidders, are the people who make the auction and the raffles a success for COA and for the Grants program. There were so many donors that we feel confident we have missed a few! Sorry, but we send a special thanks to any donor who is not listed below.

Shell Dealers and Other Organizations

Catherine R Adams; John Bernard, Shelloak; Jose and Marcus Coltro, Femorale; Mary D'Aiuto; Donald Dan; Fernando G. Dayrit; Bruno de Bruin, Capensis Seashells; Delaware Museum of Natural History; Panagiotis Demertzis; Gunasena de Silva Seashell Gallery, Sri Lanka; Bev and Al Deynzer, Showcase Shells; Phil Dietz; Dillards of Orlando; Glen Duffy; Lorraine B. Earle, Sea All Designs; Gayfers of Orlando; Myrna Golden, Golden Philatelics; Harcourt Brace & Company; Brian Hayes, Algoa Bay Specimen Shells; Sue Hobbs; Magras Ingenu, Inter Oceans Museum, FWI; Christel Jacobs, Australian Specimen Shells; Dorothy & Robert Janowsky, Mal de Mer; Fely and Carlos Leobreria, Carfel Shell Export; Betty & Robert Lipe, The Shell Store; Sarah Lyons; J. Ross Mayhew, Schooner Specimen Shells; Dr. Paula Mikkelsen, American Museum of Natural History; Paul R. Monfils, Northeast Natural History Imports; Old Town, Kissimmee, FL; Walter C. Paine, Norwich, VT; Carmen Painter, Caribbean Shell Source; Dov Peled; Mique and Pinky Pinkerton, Mique's Molluscs; Guido T. Poppe; Red Lobster of Orlando; Lynn Rubinowitz, BenJane Arts; Ed & Mary Schelling, Edward T. Schelling Worldwide Specimen Shells; Shell World, Orlando; Daniel Spelling Specimen Shells Sales; Splendid China, Kissimmee, FL; Kevan and Linda Sunderland; Chris Takahashi; Tupperware, Kissimmee, FL; Jorge Alberto Vasquez Specimen Shells

Individuals

Mary Ellen Akers, Carlos Alphonso, John A. Baker, Evelyn Bensch, Yvonne Bequet, Dr. Don & Eloise Bosch, Linda and Jim Brunner, Laura and Glen Burghardt, Pat Burke, Kathy Campbell, Edie and Chip Chippeaux, Lucy and Jerry Clampit, Pattie and William Clendenin, Jose Ramon Sanz Climent, Jenny Scarboro Cline, Bobbi and Jim Cordy, Bruce Crystal, Beth Dehaas, Marion and Glen Deuel, Sylvia Dominey, Kay and Les Easland, Sim Swee Fhai (Malaysia), Alan Gettleman, Ruth Goodson, Lucille and Dave and Kristen Green, Betty Hamann, Ardeth Hardin, David & Lyn Hargreave, Fred R. Hinkle, Bobbie Houchin, Barbara Hudson, Mary Hughes, Anne Joffe, Scott Jordan, Kristina Joyce, Terumichi Kimura, Georgette Laforet, Widodo Latip, Dr. Jose H. Leal, Harry G. Lee, Fred Leonard, Charlotte Lloyd, Irene Longley, Steve Lonhart, Dr. George Metz, Constantine Mifsud, Eduardo Moreira, Hiroshi Munekata, Helmut Nisters, Rev. Dan and Toni Parrish, Travis Payne, Kermit and Gloria Pearson, Betty Jean Piech, Rhoda Poenisch, Bret Raines, Dr. Howard and Cile Ramey, Homer and Ann Rhode, Trevor Roberts, Bonnie Rosenberg, Walter Sage Collection, George Sangiouloulou, Cathie Scanlon, Lynn and Richard Scheu, Christa and Dieter Schmidt, Dorothy Schneider, Olive Schoenberg-Dole, Fred Schroeder, Sylvia & Mel Springer, Jordan Star, Larry Stiles, Charles Sturm, Jr., Rosalie and John Taylor, Doris K. Underwood, Myra Venable, Roger Vorhees, Freida and Harold White, Ray Wichus, Josy & Ben Wiener, Peggy Williams, Dean Woodard, Dorothy and Donald Young

Convention Heroes and Sheroes

Thanks from all of COA, especially from those of us who attended the 1998 Convention, go to all the 1998 Convention Committee and our hosts, the Central Florida Shell Club for a beautiful and successful convention. It was truly a memorable and eventful week!

But special thanks are due to the following people: Joan Field who organized the banquet almost single-handedly; John Parkhurst who, in addition to doing convention photography, acted as chief go-fer for just about every aspect of the event; Phyllis Gray, our gal on the computer, who did such a magnificent job on registration; Lucille and Dave Green who were Auction Chairmen for one of the most successful and profitable auctions in COA history; and finally, Convention Chairman Linda Koestel, from whom all the answers had to come, and on whose shoulders all the planning fell and all the responsibility lay. Thank you!

Around the Clubs

by Betty Lipe and Linda Brunner

Our member shell clubs are always up to something new and interesting. Below is a sampling:

- Three members of South Carolina's Palmetto Shell Club have become involved in a project sponsored by the Irmo-Chapin Recreation Commission and the Lexington School District. Project Love — Let Older Volunteers Educate — brings older, generally retired citizens into the schools to share their special interests. They eat lunch with the students and spend an hour with them in class.
- Lala Paddock, club president, goes to two schools each week to show and explain shells to third and fourth graders. Arlene Lowman, club secretary, and Carol Simpson, newsletter editor, join her at a new school near their homes in Ballintine. They take shells from their collections and explain about each shell to the students. They report that they are learning as much as the children.
- Not to be outdone by the ladies, Harold Brown has joined the Turtle Patrol for Harbour Island, Huntington Island and Fripp Island.
- Other PSC members have been active beach sweepers at Huntington Beach State Park.

At the July COA Convention the COA Club Reps got together, and as we were talking about what each club was doing, some interesting items surfaced:

- Astronaut Trail Shell Club in Florida has started a Junior Shell Club (Good Luck!)
- Sea Shell Searchers of Brazoria County, Texas take part in their County Fair. Good place to meet new people!
- Suncoast Conchologists of Florida have a monthly study group where a few members can get together to study some aspect of shells or shelling.
- Jacksonville Shell Club, Florida, sends speakers to public schools and they have developed shell resource kits for the public schools.
- The Palmetto Shell Club of South Carolina fills lamps with local shells and sells them to gift shops to raise money and let people enjoy the local shells.
- The Conchologists of Brasil in South America are doing an ecological project to prove that shell collecting is not damaging the environment. They also place exhibits at schools and libraries.

If your club has an interesting way of interacting with the public, please write to Betty Lipe, 9829 91st Terrace, Seminole, FL 33777

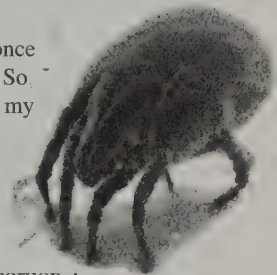
COA Officers and Directors for 1998-99

President - Linda Brunner
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Zillions of Bugs Inside Some of Your Shells!

By Marcus Coltro

I've always noticed the tiny fine brown dust (the dried mollusk) that falls from seashells. I remember one friend told me once that this is a perfect habitat for acarids. So I took a little bit of this dust and put in my microscope. I didn't see a thing. But I left for a few minutes and decided to take another look: little creatures were crawling all over the dust! There were so many of them that I wondered how many could live inside a shell. In this little portion I counted more than 30! I don't have to tell you that I decided to wash all my stock, especially the ones in which I smelt a "perfume" which all of you know very well. The scientific name of these tiny shell tenants is *Dermatophagoides pteronyssimus* and a lot of people are allergic to them. Even if you are not allergic, you may recall times when you were handling some of your old shells and started to sneeze or your nose itched...



Of course there are zillions of these small bugs everywhere, but I suggest keeping your collection in a ventilated and dry place. We have here in Brazil a small machine that they say keeps this disgusting creature away from a small area or room. I don't know if it really works, but I saw it inside the mummy cabinets in Cairo, Egypt. I have some in my office, but the best way is to periodically wash the collection, or at least any suspect shells. And of course if it doesn't work, you still can use some antiallergenic medicine...

A group of about 20 Conch-L subscribers, many of them COA members, who live near the Washington DC area will be gathering in September for a tour of the Smithsonian collection hosted by Gerta Deterer. We look forward to hearing more about their visit in a future issue.

AMU AWARDS FIRST GRANTS

The American Malacological Union announced the first of its annual awards in support of student research. AMU awarded grants to two students: Heather Bennett of the Dept. of Biology, University of Rhode Island for "Functional morphology, histochemistry, and ultrastructure of the pedal glands of protobranch bivalves" and Joseph T. Thompson of the Dept. of Biology, Univ. of North Carolina at Chapel Hill for "Ontogenetic changes in the architecture and composition of collagenous networks essential for skeletal support and locomotion in squid."

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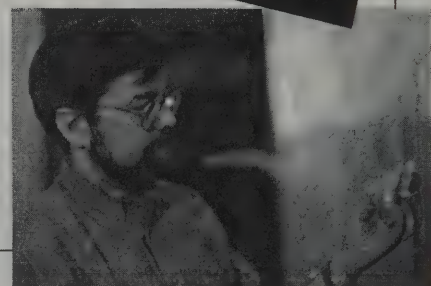
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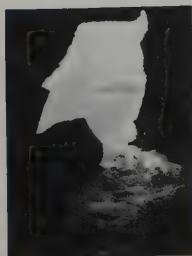
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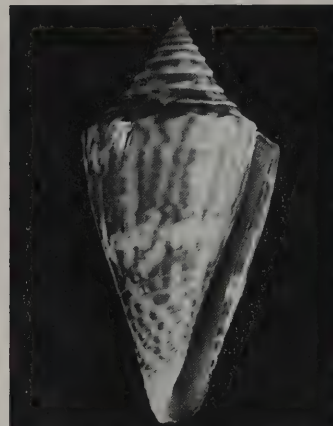
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CONIDAE OF THE CARIBBEAN: PART IV

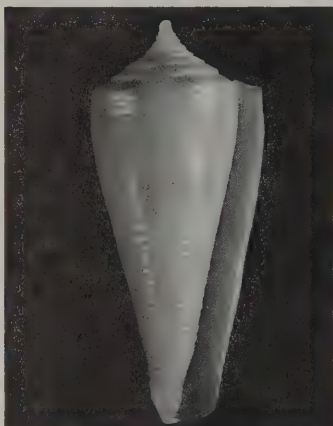
by Kevan and Linda Sunderland



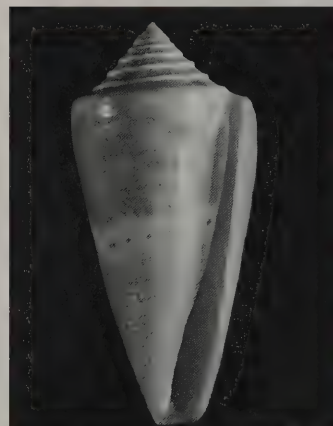
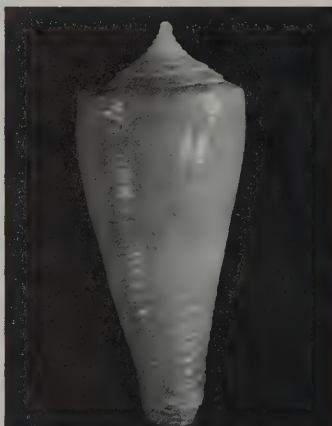
Conus ceruttii Cargile, 1997. 26 mm. 100', offshore banks of Honduras.



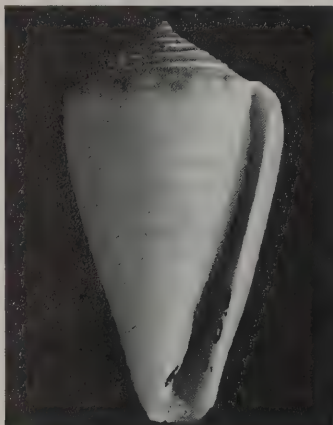
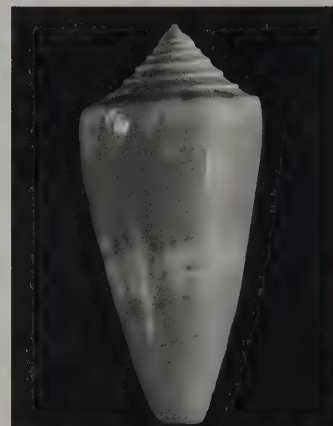
Conus ernesti Petuch, 1990. 26 mm. 70' dredged, Portobelo, Caribbean Panama.



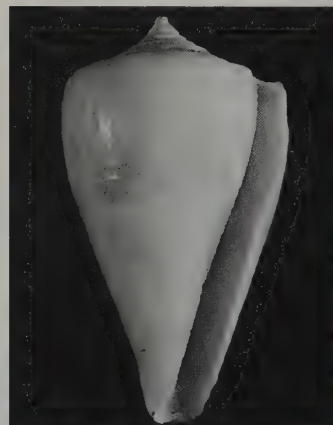
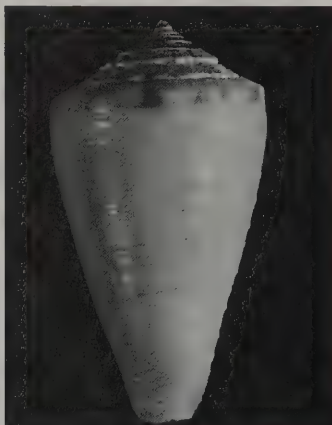
Conus eversoni Petuch, 1987. 19 mm. 40-60' in reef rubble, Utila, Bay Islands, Honduras.



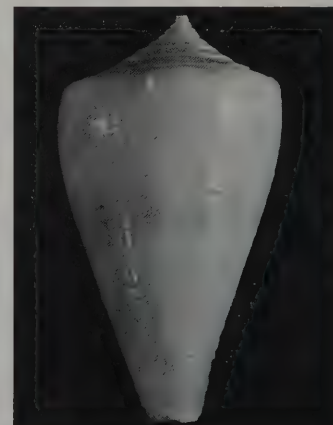
Conus floridanus tranthami Petuch, 1995. 32 mm. 30' in sand in reef area, off Sandy Key, Key West, FL.



Conus havanensis Aguayo & Perez Farfante, 1947. 19 mm. 30' in reef rubble, Cay Sal, Bahamas.



Conus ignotus Cargile, 1998. 18 mm. 50' in sand in reef area, Quita Sueno Bank, off Nicaragua.



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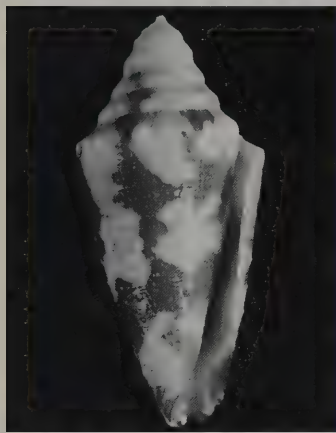
References:

- Abbott, R. T. 1974. *American Seashells*, 2nd Ed. Van Nostrand, Reinhold Co., New York.
Cargile, W.P. 1995. Description of *Conus julieandreae* n. sp. from Eastern Honduras. *La Conchiglia* 27(275): 24-30.

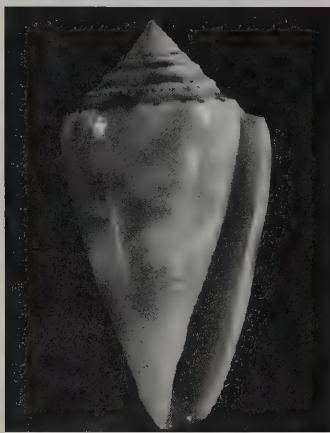
_____, 1997. Description of *Conus ceruttii* n. sp. from Eastern Nicaragua. *La Conchiglia* 29(282):48-55.

_____, 1998. Description of *Conus ignotus*, a new species from Nicaragua. *Siratus* 14: 9-14.
Petuch, E. J. 1987. New Caribbean Molluscan Faunas. The Coastal Education and Research

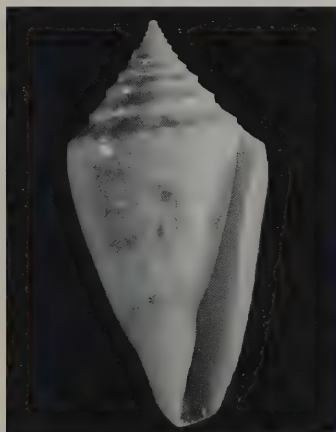
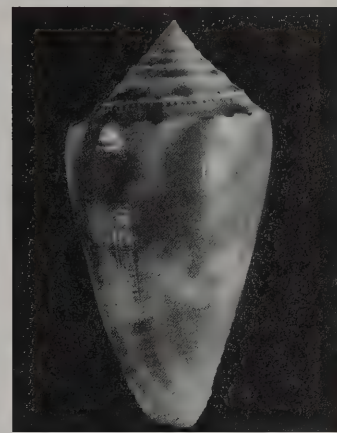
The intent of this feature is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



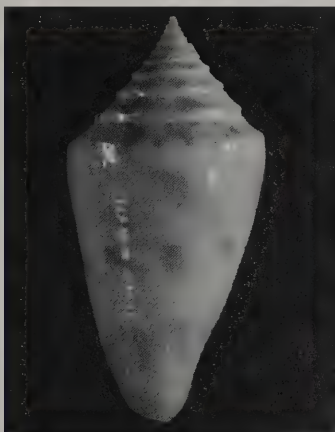
Conus julieandreae Cargile, 1995. 24 mm. 50' in sand & rubble, East Honduran offshore banks.



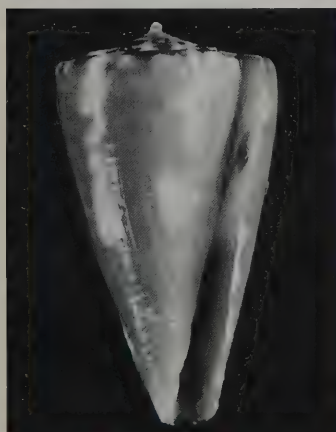
Conus mindanus Hwass, 1792. 34 mm. 40' in sand, Ron's Reef, Palm Beach, FL.



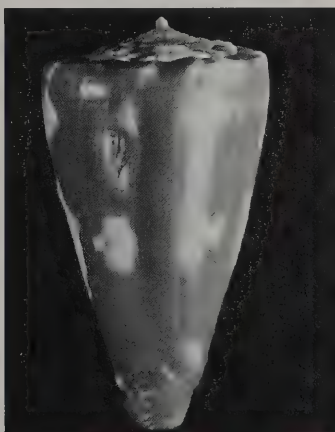
Conus mindanus agassizii (Dall, 1886). 31 mm. 225 meters, dredged, St. James, Barbados. Ex Finn Sander collection.



Conus paschalli Petuch, 1998. 22 mm. 50' in muddy sand, dredged off La Ceiba, Honduras.



Conus richardbinghami Petuch, 1992. 29 mm. 70' in reef, south of Bimini, Bahamas.



Conus ritae Petuch, 1995. 24.5 mm. In reef area, offshore on Rosalind Bank, Honduras. PARATYPE



Foundation, Charlottesville, VA.

_____, 1988. *Neogene History of Tropical American Mollusks*. The Coastal Education and Research Foundation, Charlottesville, VA.

_____, 1990. New Gastropods from the Bermont Formation (middle Pleistocene) of the Everglades Basin. *Nautilus* 104(3): 96-104.

_____, 1992. Molluscan Discoveries from the tropical Western Atlantic Region Part II. New species

of *Conus* from the Bahamas Platform, Central American and Northern South American Coasts, and the Lesser Antilles. *La Conchiglia* 24(265): 10-15.

_____, 1995. Molluscan discoveries from the Tropical Western Atlantic Region. *La Conchiglia* 27(275): 36-42.

_____, 1998. The Molluscan Fauna of the Wawa River Region, Miskito Coast, Nicaragua: Ecology, Biogeographical Implications, and Descriptions of New Taxa. *Nautilus* 111(1): 22-44.

REVIEWS

Compendium of Seashells by R. Tucker Abbott and S. Peter Dance. 1998 revised reprint by Odyssey Publishing. AUS\$85. US\$60.

The Compendium of Seashells, or *Compendium*, as it is affectionately known, has become a bible for shell collectors worldwide. We start seriously identifying shells with it. We have the copy from the local council library on continuous loan until we can afford our own precious copy. Some of us swear by it all through our shell-collecting lives. We recommend it to others, especially beginners, but also others lost in the wilderness of trying to identify their shells. But then, lo and behold, the darn thing goes out of print! Second hand copies command pretty high prices, so everybody has been waiting eagerly for the revised reprint, which was originally due late last year.

Now it's out, what do I actually think of it? The publisher has tried and succeeded at faithfully reproducing the original. A few changes are made in this new edition, marked with an asterisk. However, I had to look very hard to find this out; this kind of information is on the inside title page in awfully small print (gee, I must be getting old), where one also finds the bibliographic information libraries need. I cannot seem to find the marginellid photograph by Bob Lipe that is supposed to be on the title page and is referred to at the bottom of the inside title page.

I think it is a pity that the publisher did not take the opportunity to update the list of references in the back of the book. There have been many new publications of importance to shellers, not only on the 'big five' — Cones, Cowries, Volutes, Murex and Pecten — but also regional guides. Just because nothing much has happened in the US regional conchological literature, it doesn't mean that the rest of the world hasn't published anything!

I am really glad the publisher got rid of the dust jacket. Dust jackets are an annoyance; they scrunch and tear easily in heavy use. The outside cover is very well-designed and looks really pretty, although the graphic designer in me swears that whoever did the design must have had a heart attack when he saw the original — the picture is MUCH too red. Even so, I do insist that it DOES look pretty.

Well, the above is all nitpicking. It is so good to have the book back again. Nothing will ever be able to replace the good old *Compendium*.

—Patty Jansen

A revision of the Scaphopoda from Australian waters (Mollusca)
By Kevin L. Lamprell and John M. Healy, June 1998 *Records of the Australian Museum. Supplement 24: 1-189*. AUS\$81. plus AUS\$15 postage Economy Air to US.

The scaphopods, or tusk shells, are well-represented in the Australian molluscan fauna, especially in northern Australia. However, up till now it has been virtually impossible to identify many of these species, because any literature was scarce, more than 40 years old, and concentrated on southern Australian species. Enter this long-awaited volume. Kevin and John have spent years working on this volume, examining the scaphopod collections from Australian and overseas institutions and all type specimens.

This work describes and reviews for the first time the entire Australian scaphopod fauna. A total of 108 species belonging to both scaphopod orders, eight families, and 16 genera, are described. The species are illustrated in black and white photographs, and meticulous black and white line drawings.

The work describes 47 new species, and records many species from Australia for the first time. Many species are photographed for the first time. Also, the parameters of a number of genera were revised according to radular ultrastructure and shell morphology. Many long-standing

identification errors are rectified through study of the original type material. For each species an Australian distribution map is provided, but ranges outside Australia are mentioned.

Kevin Lamprell is a well-known author on the Australian molluscan fauna, especially bivalves. He has co-authored three books on Australian bivalves, *Bivalves of Australia Vol. 1* and the recently published *Bivalves of Australia Vol. 2*, as well as *Spondylus, Spiny Oyster Shells of the World*. He has also co-authored many scientific publications describing new species.

John Healy is a senior research fellow at the University of Queensland. He has been working with Kevin for a number of years, and has co-authored many publications describing new species of bivalves or scaphopods. He is known for his scientific work on the taxonomic importance of molluscan spermatozoa.

Scaphopods is going to be a volume of importance for all general collectors of Australian and Indo-Pacific shells. Although published in a rather scientific journal, it is really very useful for collectors. Even the fact that the pictures are not in colour does not make too much difference. Actually, I wonder how much colour photos would have added in appeal of this work: most of the shells are white anyway! One of the drawbacks might be that all shells look the same in the photos. Unfortunately, scaphopods do have a tendency to look alike, and when the authors had just embarked on this project, I heard Kevin utter many words of regret that he ever started it in the first place. But they have devised a great way of identifying the scaphopods by looking at their cross-sections at the top and bottom. These features are illustrated in line drawings, and add much to the value of this work and set a standard for identifying scaphopods worldwide.

Open the bottom drawers of your shell cabinet and start identifying your scaphopods!

—Patty Jansen

Bivalves of Australia Vol. 2 by Kevin Lamprell and John Healy. Backhuys Publishers, Leiden, March 1998, ISBN 90 73348 92. 288 p., 112 plates, 89 in colour, hard cover, 175 x 244 mm. AUS\$94.95.

This book has been long awaited and will be a very valuable addition to the now impressive array of books on shells from Australian, and Indo-Pacific, waters. Right up until the publication of *Bivalves of Australia Volume 1*, there was really no shell book at all that contained a significant number of Australian bivalves. When trying to identify our bivalves, we were left fumbling around in the dark. Volume 1 was a very important step in the right direction, but many of us, including myself, joked about all the interesting families that were left out. In the end, though, that is basically what it came down to: the difficult families, including the Mytilidae, Arcidae, and Pteriidae needed much more work, especially due to their wide Indo-Pacific range, and they were left out of Volume 1, which contained only 25 families.

To complete the work on the Australian bivalves, Kevin had to travel to the European museums to study type material, and he had to describe new species before this book could be published. And he had to study the complete nightmare of the tiny Australian bivalves, an area that almost every Australian worker has steered well clear of.

He also had to find a new publisher, and a new co-author for Volume 2 of *Bivalves of Australia*. Kevin Lamprell is well-known for his extensive knowledge on bivalves. He is the author of *Spondylus, Spiny Oyster Shells of the World*, and *Bivalves of Australia Vol. 1* (together with Thora Whitehead) and many scientific articles describing new species of bivalves. John Healy, a senior research fellow from the University of Queensland, co-authored many of these scientific publications with Kevin, and became the co-author of this latest book.

The result is well worth all the work and, together with Volume 1, gives a pretty good account of the Australian bivalve species. Seventy-two families are included in volume 2, the remainder of the

bivalve families known to occur in Australia, that were not included in Volume 1. The key families covered by this volume are Arcidae (nine plates), many of which have never been photographed, the Mytilidae (ten plates), the Pteriidae (six plates), as well as the Ostreidae and Spondylidae. Quite a few species in these families are of economic importance. Then there are the more unusual families, like the Ungulinidae, Galeommatidae (six pages!), Solenidae, Corbulidae, Teredinidae, Myochmidae and the Clavagellidae. The book also gives a good summary of the current knowledge, or rather, lack thereof, of those pesky Australian micro-bivalves. Also included are the Australian freshwater bivalves.

It is a neat and tidy publication, with an abundance of good figures. I especially like the layout of the book, with the text positioned next to the plates. There are 112 plates, 89 of which are in colour. The other ones are black and white photographs (freshwater mussels) or reproductions of original drawings of type specimens (micro-bivalves).

This book is going to prove very useful. When I first looked at it, I immediately recognized some species from the bottom drawer of my shell cabinet. These shells had been in there for a long, long time and several times I had almost thrown them out, either thinking them juveniles of something else, or just out of sheer frustration at not being able to identify them.

I really cannot say many bad things about the book, especially about its content. I still do not like the font the publisher has chosen. I think it looks cluttered and I especially feel that the absence of proper headings for the family and genus names makes it very hard to see where one family stops and the next one begins.

I also think the front cover could have been a bit kinder to the eye, but I guess that is really a matter for personal preference. At least you will be able to see it on your bookshelf from considerable distance. It probably even glows in the dark. But then, that stand-out quality is doubtless indicative of the importance of this work for anyone with an interest in Australian and Indo-Pacific bivalves. —Patty Jansen

Fauna of Australia vol. 5: Mollusca: the Southern Synthesis Edited by Pamela L. Beesley, Graham J.B. Ross and Alice Wells, January 1998 ISBN 0 643 05756 0, 1250 pages, 2 volumes (not sold separately), b/w line drawings, b/w SEM, and colour photos, 219 x 302 mm. Published by CSIRO Publishing. (A\$295 + postage Economy Air: A\$45 Europe and Africa, \$40 Americas and W Asia, \$35 SE Asia)

Have you ever wondered why the Mitridae and Costellariidae are two separate families? Or needed some background information on the Vitrinellidae? Or wanted to know what key publications exist on the Rissoidae? Or you may want to know more about the reproductive organs of gastropods, or about rocky shore ecology, or you may want to have an up-to-date systematic list of the Mollusca.

This is the work to answer all your questions! Although the title suggests that the work is limited to Australia, this is really not the case, because much of the information is of a very general nature. This work summarizes the current state of knowledge on the taxonomy, anatomy, biology and ecology of the families of molluscs that are known to occur in Australia. Most of these families, of course, have members in other parts of the world as well.

Over 70 authors from different disciplines within the molluscan science and 15 artists have contributed to this mammoth work, which has been years in the making. Great effort has been made to uncover anything that has been written about the molluscan families in the book.

The resulting work is two big, heavy volumes packed with information. The 1250 pages are split into volume A, covering the bivalves and B, covering the gastropods and cephalopods. Both volumes together weigh more than 5kg.

The extensive introductory chapters deal with the history of malacology in Australia and its major contributors, general morphology and physiology of the mollusca, molluscan life history, the ecology of shore life, adaptations of terrestrial and freshwater mollusks, biogeography, fossil mollusks, methods and techniques in malacology and conservation.

The main section of the book presents a systematic account of the families of mollusks known to occur in Australia. Family descriptions include discussions of the taxonomy, paleontology, anatomy and ecology of molluscan families, illustrated with many exquisite line drawings of shells, or animals. The work does not present any new research, but gives a very thorough overview of what has been published, and this of course extends to work done outside Australia. Beyond just illustrating what has been done, this work also highlights gaps in our current knowledge, of which there are many. Each section has an extensive reference list.

Unless you are a professional molluscan taxonomist, you will find many families in the book that you have never heard of. Some of these are re-groupings of older families, and include larger and well-known species. It is the first time, for example, that I have seen Nacellidae as a family for the limpets of the genus *Cellana*. The book also maintains the Nassariidae, Fasciolaridae and Melongenidae in separate families, rather than joining them with the Buccinidae as has been the trend in recent years.

Mollusca: the Southern Synthesis is not an identification tool. The discussion of taxonomy stops at genus level. You may just be able to identify a species or two from the examples. Many people have expressed regret at this limitation, but to produce a similar work to species level would have been impossible. There are over 2000 species recorded from Sydney alone. The micro mollusks from northern Australia are still largely uncharted territory. However, that said, I do think that this series illustrates the rather worrying trend of professional taxonomists to move into studying the higher taxonomy, sometimes leaving the mundane job of describing new species to amateurs.

Don't buy this work for the colour pictures. Although each volume has a well-designed middle section with great photographs of live animals, the bulk of the work is illustrated with exquisite black and white line drawings, which show much more detail than a photograph ever could. Unfortunately, it doesn't come cheap, and the price is probably the major drawback for those interested in this book. We simply must live with the fact that to produce such a work for such a limited audience brings with it a high cost per book. Nevertheless, students, professional malacologists, university libraries, and the serious amateur malacologists have simply got to buy this book. —Patty Jansen

A revision of the Scaphopoda from Australian waters (Mollusca), Bivalves of Australia, Volume 2, The Compendium of Seashells and Fauna of Australia vol. 5: Mollusca: the Southern Synthesis are all available at the stated prices from Capricornia Publications, P.O. Box 345, Lindfield NSW 2070, Australia. *The Compendium of Seashells* is also available from Mal de Mer Enterprises, P.O. Box 482, West Hempstead NY 11552, USA

Oops!Oops!

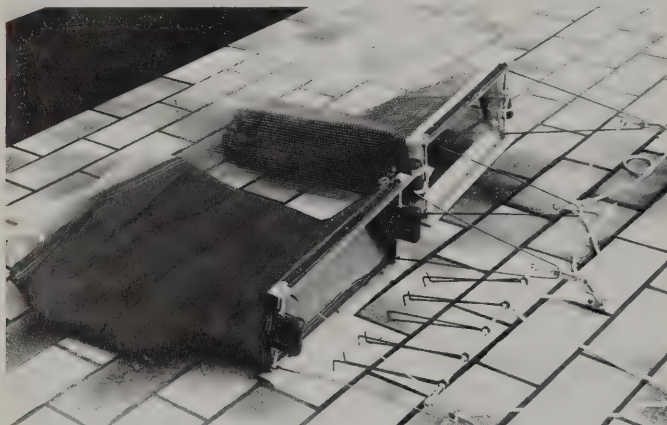
In the March 1998 issue of *American Conchologist*, Dr. G. Thomas Watters was the reviewer for Part II of Roland Houart's *Les Muricidae d'Afrique occidentale*, which covered the Tripterotyphinae, Typhinae, Trophoninae & Rapaninae and which was published in *Apex* 12(2-3): 49-91. We failed to give him credit for his excellent review. In the June issue, credit to Tom was again omitted. Here it is at long last, Tom, with our apologies.

The Evolution and Tribulations of the Norwegian Suitcase Dredge

by Ross Gundersen

For several years I have been surveying the micro mollusks of Sanibel Island. I started out by beach collecting. This did indeed produce a limited number of micros. However, they were worn and sometimes hard to identify. I quickly realized that I had to collect living micros. Needless to say one does not wade or snorkel to effectively find micros. The solution to this dilemma was a dredge.

I happily set to work designing a small dredge for collecting micros, and anything else that got in its path. Off to the hardware store! I purchased a veritable plethora of goodies: hardware cloth, 1"X1/8" steel bar, 1/4" threaded steel rod, nuts, washers, and aluminum carpet edging strip. A visit to the local dive shop and fabric store resulted in the purchase of some old two-pound dive weights and several yards of beautiful bright blue ripstop nylon. The last component needed was some material to make a net to fit into the dredge. Bioquip, an entomological supply company, had some polymer netting with a pore size of 0.5 mm.



Two versions of my first attempt at dredge construction.

Into the basement I went to fabricate the ultimate dredge. Pardon me, my hubris is showing. I built two dredges. The main frame of each dredge was made from two pieces of carpet edger strip reinforced with the steel bar stock with an opening of 16"X 8". The first had a 1/4" hardware cloth box attached to the main frame into which the net was inserted. The second one was my pride and joy. Attached to the main frame was the bright blue ripstop nylon inside of which was the net. Needless to say I was very proud of myself.

I shipped the dredges to the Bailey-Matthews Shell Museum and met up with them and Dr. Jose Leal a few days later. Jose had arranged for Stan to take us out dredging in his sailboat. We embarked on our dredging expedition early in the morning. Stan took us out by Lighthouse Point. I took my pride and joy, the dredge with the bright blue net, and lowered it over the side and released line until I started to feel it bumping over the bottom.

We were going along just great and then wham!!! The dredge suddenly stopped moving. We backed up until we were over the dredge. It wouldn't come loose. I thought I had lost my beautiful dredge. Stan suggested that we use the windlass to hoist up the dredge. I cranked until my arms ached. Eventually we could see the dredge. It was full of sand and must have weighed several hundred pounds. We couldn't get it on board. The question that Jose then asked me broke my heart: "Do you have a knife?" Jose went overboard and slit the bottom of the net bag to release its contents. The dredge then weighed only 8 pounds and came on board easily, but rather badly bent and mangled. Jose,



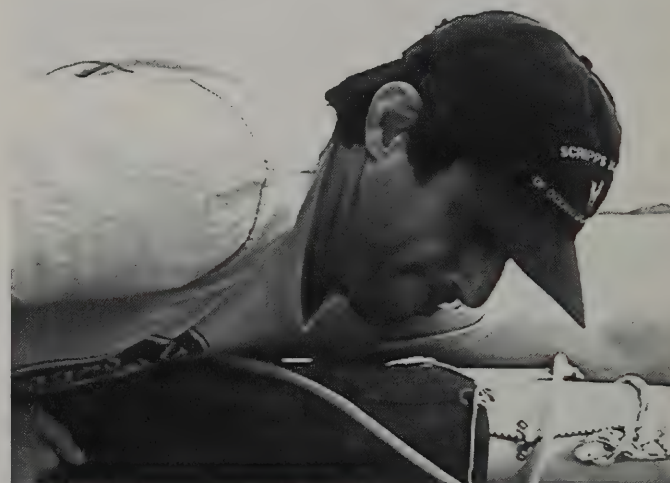
The final version of the Norwegian suitcase dredge.

with his wonderful sense of humor, simply said: "At least we know it is an efficient dredge." All I could do was groan and feel sorry for myself. I had learned that a dredge must have a release at the bottom of the net.

The hardware cloth dredge then went overboard and performed perfectly. The hardware cloth envelope kept the dredge horizontal to the bottom. We collected numerous samples using this dredge.

On the way back to the marina the fun started. We observed four huge cabin cruisers bearing down on us in the channel. Stan prudently pulled over to the side of the channel. We hadn't even left the channel when the keel hit bottom and stuck fast! The motor on the sailboat couldn't break us free.

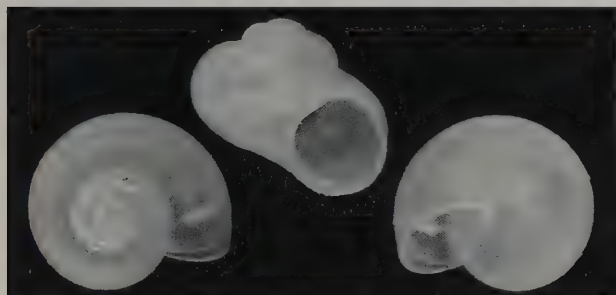
Stan suggested that someone should climb out on the boom to tilt the boat on its side to free the keel. Jose volunteered for the mission. He shinnied his way to the end of the boom and sat there with a peculiar look on his face, muttering something about anatomy. This trick didn't work and Jose gratefully got off the boom. Stan had to call the equivalent of a towtruck to get us unstuck, after which we breathed a sigh of relief and proceeded.



Dr. Jose Leal after being demoted from museum director to counterweight on ship's boom.

When we got to the drawbridge on the causeway it was down. Stan pushed on the tiller and proceeded to do circles while waiting for the bridge to go up. A lively conversation ensued. When we looked up we realized we were very close to the bridge and the tide was quickly carrying us toward the bridge. Stan hit full reverse, and we hit the timbers protecting the bridge pilings. I grabbed onto the timbers for dear life

and looked up at the mast with a sinking sensation in my stomach. The mast had touched the bridge and was beginning to bend and I had visions of its collapse! Luckily the drawbridge attendant raised the bridge verrrry quickly and we escaped without further mishap, unless one counts out our feeling of being rather chagrined and the fact that I felt as if I had left all ten fingernails in the timber around the pilings. These were hazards of collecting which have yet to be mentioned on the COA listserv. Luckily we got back to the marina without any further mishaps.

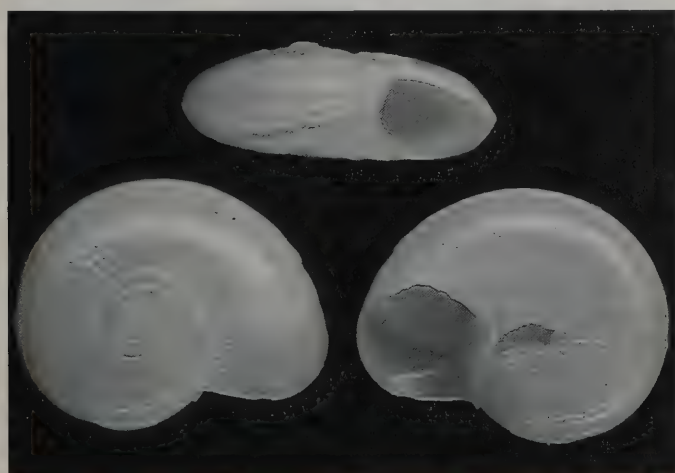


Lissospira sp.

The material we had dredged yielded many micro mollusks such as: *Turbonilla arnoldoi*, *Vitrinella floridana*, *Solariorbis blakei* (my favorite), *Teinostoma parvicallum*, *Caecum johnsoni*, and many others. I also had learned how a dredge should be built. When I got home I retreated into my basement one more time. The main frame design of the dredges had worked perfectly and I didn't change it. The simple hardware cloth box was removed and replaced with two rectangular steel frames to which the hardware cloth was attached. The net bags were modified with either a zipper or Velcro to provide a release built into the bottom of the net. In addition, the dredge was designed to be collapsible and to fit into my suitcase with plenty of room to spare. The initial attempts at dredge building had now evolved into the Norwegian Collapsible Suitcase Dredge.

I have since then packed my suitcase dredge and taken it to Jamaica and back to Sanibel. These trips were without mishap, except perhaps when I was unloading the dredge in rolling seas and felt a sudden urge to "feed the fish." The steel frames keep the dredge parallel to the bottom and the zipper and Velcro release on the net functioned perfectly. The hauls have yielded many different micro mollusks as well as opisthobranchs and nudibranchs.

Well, it is back to sorting the dredged grunge samples and planning my next dredging expedition.



Solariorbis blakei Rehder, 1944



Phyllaplysia engli Marcus, 1955 (left) and an unidentified opisthobranch

1998 FALL SHELL SHOWS AND MEETINGS

by Donald Dan, COA Awards Director

The Summer Shell Show calendar was inadvertently left out of the June issue of American Conchologist. Our apologies to Don Dan and to all of you readers who depend on his listing.

Sept. 19-20 International Shells & Fossils Bourse,
Ottmarsheim, France
Michel Rioual, 2 Rue des Vergers
68490 Ottmarsheim, France (3) 89-26-16-43

Sept. 18-20 North Carolina Shell Show,
Kure Beach, North Carolina
John Timmerman, 206 Quail Ridge Road
Wilmington, NC 28409-2637 (910) 452-0943

Sept. 26-27 Central Florida Shell Show, Orlando, Florida
Darryl & Helen Kwait, 1329 Sterling Oaks Dr.
Casselberry, FL 32707 (407) 695-3887
E-Mail: DKWIAT@MICRO-ENERGY.COM

Oct. 2-4 Annual German Shell Fair, Oehringen, Germany
Kurt Kreipl, Hoehenweg 6 (49) 7941-62826
D-74613 Oehringen-Cappel, Germany
FAX 7941-62065

Oct. 31 British Shell Collectors' Club Shell Show,
London, England
Kevin Brown, 12 Grainger Road
Isleworth, Middlesex TW7 6PQ, England
(181) 568-8333

Nov. 7-8 Philadelphia Shell Show,
Philadelphia, Pennsylvania
Al Schilling, 419 Linden Ave.
Glenside, PA 19038 (215) 886-5807

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CONCHATENATIONS

In Praise of Mollusks

by Gary Rosenberg

What qualities make mollusks special? I don't mean the structures they possess, such as radula and mantle cavity, and calcium carbonate crystals. These help define the Mollusca as distinct from other phyla. But each phylum has unique structures that characterize most if not all of its members. What makes mollusks better than all other phyla? I shall argue that the combination of numerosity, ubiquity, accretionary growth, and durability make mollusks praiseworthy. That is, they are abundant, diverse, and widespread, their method of growth preserves a record of their life, and the shells don't rot when the animal dies. Other phyla have some of these properties, but only Mollusca has them all.

Proponents of other phyla have no doubt put forth similar lists, but I shall ignore these until confronted with them. To show that I am not completely biased, however, I will admit the flowering plants (angiosperms) to the competition, since divisions among plants are equivalent to phyla among animals. For simplicity, in the phylum Chordata, I'll consider only its most familiar subgroup, the vertebrates.

Numerosity: Among the animals, only the Arthropoda, because of the insects, have more species than the Mollusca. There are some two million known living species of arthropods, as compared to about one hundred thousand known living species of mollusks. Arthropods also beat mollusks for sheer number of individuals, but mollusks compensate with superior ubiquity. Two other groups warrant mention: the vertebrates, with about 50,000 living species, and the vascular plants with around 250,000. Nematode worms might ultimately prove to have extreme species level diversity, and they certainly exceed arthropods for number of individuals, but being mostly microscopic and lacking hard parts, they fall short on durability and charisma. Within Mollusca, gastropods have about 80% of the total species diversity, although bivalves are more abundant in some habitats.

Ubiquity: Mollusks are abundant in terrestrial, freshwater, and marine systems, whereas diversity in arthropods, particularly insects, and in vascular plants, is concentrated on land. The vertebrates resemble mollusks in having species diversity more evenly distributed in each of the three ecosystems. Most of the major vertebrate body plans (birds, reptiles, amphibians and mammals) are represented on land, with most marine diversity among fishes; whereas only gastropods are terrestrial among mollusks, with the other classes being aquatic.

Accretionary growth: Most mollusks have an unusual kind of growth, in that the accretionary method preserves a record of the life of the individual, often including even the larval shell. In contrast, arthropods shed their exoskeletons and vertebrates generally remodel their bones as they grow, which means little can be inferred about the larval or juvenile stages by study of the adult. Other organisms that have accretionary growth include trees, corals (Cnidaria), lamp shells (Brachiopoda), bryozoans, some echinoderms, and some vertebrates (e.g., turtle shells). Of these, none except some inarticulate brachiopods (e.g., *Lingula*) preserve larval or embryonic structures in the hard parts of the adult. Articulate brachiopods do not produce a shell until the post-larval stages. In mollusks, accretionary growth produces the logarithmic spiral characteristic of their curvaceous shells, but among other phyla with accretionary growth, only brachiopods have a logarithmic spiral.

Durability: Most phyla lack skeletons, so their remains are unlikely to persist after the death of the animal. These phyla can be lumped in the broad Linnaean category of Vermes (worms) and banished from further consideration. Only animals that have skeletons are likely to be preserved in the fossil record. Having a skeleton, however, does not guarantee preservation. The exoskeletons of arthropods and the bones

of vertebrates rapidly decompose, and, as a consequence, fossil arthropods and vertebrates are much rarer than fossil mollusks. Of course, shells of mollusks can decompose also. They can dissolve away in water that is not saturated with calcium carbonate. Shells of dead land snails are often cannibalized by other snails seeking a source of calcium. Nonetheless, mollusk shells are common on beaches worldwide and are the commonest large fossils in many geological formations. Only microscopic organisms such as foraminifera, diatoms, and pollen are more abundant as fossils than mollusks.

What conclusions might be drawn from these molluscan properties? The most numerous and ubiquitous mollusks are the gastropods, which are also most popular among conchologists. Logarithmic accretionary growth unifies snails, bivalves, and scaphopods, along with *Nautilus*, *Argonauta*, and *Spirula*, but excludes other cephalopods and slugs, which are less popular. Durability is also of obvious value to collectors, and may account for the lack of popularity of chitons, in which the valves disarticulate after the animal's death, complicating preservation.

Curiously, the very properties that make some mollusks attractive to collectors also make them important for scientific study. Accretionary growth preserves a record of the animal's life, allowing inferences about the larval development, or the types of predators that might have damaged a shell. Many shells change proportions or sculptural patterns as they grow. For example, *Cerion* starts off with a trochoidal shell that changes to cylindrical. If mollusks shed their exoskeletons, as do arthropods, such changes would have to be reconstructed by study of many shells at different stages of growth, rather than being read directly from an individual shell.

The oldest part of a shell is at the apex or umbo, the youngest part at the aperture. Because many mollusks are long lived (more than 100 years in bivalves such as *Margaritifera* and *Arctica*) and generally have low dispersal ability as adults, changes in chemical composition along the shell can reflect changes in local environmental conditions. The typical lifespan of a species might also be inferred from its shells, because isotope ratios fluctuate seasonally. Counting the number of seasonal cycles determines the age of the shell. Such information might be useful, for example, to determine the age at which a species starts reproducing, which is needed to calculate the maximum sustainable yield of a fishery (along with average number of offspring and mortality rates).

Because mollusks are numerous and ubiquitous they are excellent indicators of environmental quality in many habitats. Land snails, for example, are sensitive to acidification, which makes it harder for them to obtain calcium. Decline of a mollusk population can be an early warning sign of environmental degradation. Shifts in species' ranges may signal global warming.

Accretionary growth of molluscan shells coupled with durability means that inferences are not restricted to living mollusks. Some bivalves form annual growth bands, which can allow reconstruction of a timeline from long dead shells, in the manner common with tree rings. Chemical analysis of shells stored in collections can help to determine the environmental conditions when and where the animals lived. For example, shells collected before 1945 reflect the carbon isotope ratios at sites around the world before contamination by the first atomic bomb blast.

Moving farther back in time, the extraordinary fossil record of mollusks makes them excellent subjects for evolutionary studies. For many groups, the time of first appearance in the fossil record is relatively well known, allowing estimates of rates of speciation and extinction. By understanding how environmental changes affect rates of speciation and extinction, it may be possible to predict, and ultimately to lessen, the consequences of the global environmental changes occurring today from human activities. The special properties of mollusks make them prime subjects for such studies.

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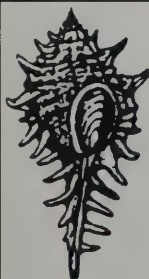
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Use of Latin Terms and Abbreviations in Taxonomy

by Andrew K. Rindsberg

There is no hard-and-fast rule about the use of "cf." and other abbreviations. However, the following usages are very widespread in biologic circles, and are required by some paleontologic journals:

Moniloconchus pauli: The identification is certain.

Moniloconchus cf. pauli (or cf. *M. pauli*): The identification is uncertain because the material is fragmentary or otherwise flawed.

Moniloconchus aff. pauli (or aff. *M. pauli*): The material is good enough to identify, and may belong to an unnamed species related to *M. pauli*.

Moniloconchus pauli?: Definitely *Moniloconchus*, but may not be *pauli*.

Moniloconchus? pauli: Definitely *pauli*, but this species may not belong to *Moniloconchus* (for instance, the taxonomy of this genus may need revision.)

?*Moniloconchus pauli*: Both genus and species are in doubt.

You will occasionally see other abbreviations, especially in the older and more technical literature. Schenk and others (1948, Procedure in Taxonomy, p. 27-29) list three pages of Latin words and abbreviations, including the following, which I have modified slightly:

aff. = *affinis* = having affinity with but not identical with

auct. = *auctorum* = of authors [that is, of various authors]

cf. = *confer* = to be compared to

emend. = *emendatio* = emended

f. = *forma* = form (also sometimes used as an abbreviation for "figure" or "footnote")

fide = trusting [the written word of]

gen. et sp. nov. = *genus [novum] et species nova* = new genus and species

ibid. = *ibidem* = the same [reference]

incertae sedis = of uncertain position

in litt. = *in litteris* = in a letter; in correspondence

lapsus calami = a slip of the pen

loc. cit. = *loco citato* = [in the] place cited [to the page; compare *op. cit.*]

mihi = [belonging] to me (i.e., my new species)

Geological Survey of Alabama, P.O. Box O, Tuscaloosa, AL 35486-9780
Email: <arindsberg@OGB.GSA.TUSCALOOSA.AL.US>

nob. = *nobis* = [belonging] to us

nom. nov. = *nomen novum* = new name

nom. nud. = *nomen nudum* = nude name (new name given without an illustration or description)

non = not

nec = nor

non vidi = I have not seen [it]

non viso = not seen

nov. = *novum* = new

olim = formerly

op. cit. = *opere citato* = [in the] work cited [but not on the same page; see *loc. cit.*]

partim = part

passim = here and there

pro parte = in part

q. v. = *quod vide* = which see

s.l. = *sensu lato* = in a broad sense

s.s. = *sensu stricto* = in the strict sense

sic = thus; [this is] so (that is, exactly as shown)

sp. = *species* = species (singular)

spp. = *species* = species (plural)

sp. nov. = *species nova* = new species

subgen. = *subgenus* = subgenus

supra cit. = *supra citato* = cited above

subsp. = *subspecies* = subspecies (singular)

subsp. = *subspecies* = subspecies (plural)

teste = according to [the spoken word of]

var. = *varietas* = variety [i.e., a subspecies]

vide = see

It is customary not to italicize "cf." or "aff." (or, for that matter, "etc." or "e.g."), though they are italicized in the list above to emphasize their derivation from Latin.

Also, an exclamation point (!) is occasionally used to indicate that the author has seen a particular specimen, not just read about it.

—Revised from the COA Listserve, Conch-L, May 13, 1998

Reference:

Schenk, Edward T., McMasters, John H., Keen, Myra A., and Muller, Siemon William, 1948, *Procedure in taxonomy* (2nd edition): Stanford, California, Stanford University Press, vii + 93 p.

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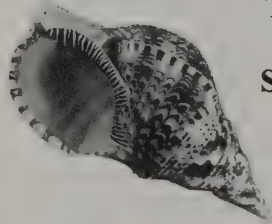
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Asperitas stuartiae (Sowerby, 1845) - southern Sulawesi, Indonesia.

THE REDISCOVERY OF A LOST LAND SHELL SPECIES?

by Richard L. Goldberg

The Indonesia land shell fauna, though well documented in the literature, still has not been fully explored. Literature dating back more than 100 years illustrates and describes numerous species which, after their initial discovery, have never been found again by field collectors. This may be due in part to the fact that the original specimens had only basic locality data, "Celebes," "Java," or "Timor," for example, which misled later field workers as to the actual habitats. Many of these species are presumably from extremely remote locations.

Sowerby described one such species as *Helix stuartiae* in *Zeitschrift für Malakozoologie* for 1845, page 8, from "Ins. Celebes" [= Celebes Islands] now called Sulawesi. Along with the Latin description of the species, the measurements of "Diam. mai. 40, min. 36, alt. 26 mill" are given, but the species is not illustrated in the *Zeitschrift*.

Helix stuartiae is one of the lost Indonesian species, rarely referred to in literature, overlooked in faunal surveys, and virtually never seen in collections. Making matters more confusing is the fact that Pfeiffer wrote the article in which the species is described. Yet Pfeiffer credited *Helix stuartiae* to Sowerby, and this is the citation given by Sherborn who shows Sowerby as author of the species.

Later, *Helix stuartiae* appeared in Kuester's Edition of the *Conchylien-Cabinet*, a long series of monographs published from 1837 to 1920. The first illustration of the species (Figure 1) appears in the non-marine monographs of *Conchylien-Cabinet* written by Pfeiffer, Clessin, Kobelt, Kuester, and others.

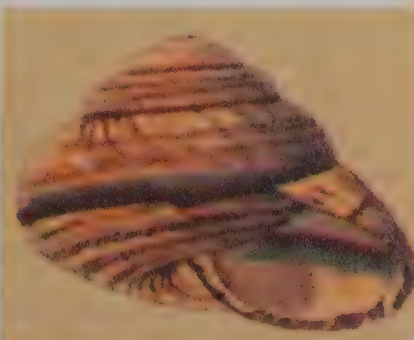
The species appeared once again in 1886 in *Manual of Conchology*, 2nd series, Vol. 2, by Tryon, who also used the Kuester illustration.

Tryon's description comments on the variability of this species. A handful of monographs from that period of time dealing with the Celebes non-marine fauna mention the species with a question mark next to the name, or with no specific data. The species has not been recorded since that time.

Recent field collecting on the islands off the southern end of Sulawesi, Indonesia has revealed a remarkable fauna of land shells, among them a beautifully banded species very closely matching the Kuester illustration of *Helix stuartiae* (Figure 2). The shell is thin and exhibits the variable fine thread-like bands described by Sowerby. Other than the smaller diameter of 32-36 mm, the shells seem identical to *Helix stuartiae*. The species also seems to conform to the characteristics of the Ariophantid genus *Asperitas*.

The uniqueness of this species, which cannot be confused with any other local non-marine species, seems to confirm the rediscovery of *Helix stuartiae*, here designated as *Aperitas stuartiae* (Sowerby, 1845). Further investigation into this species may help our understanding of the relationship between this and the many other variable *Asperitas* species from Indonesia.

The author would like to acknowledge the help of Richard E. Petit of North Myrtle Beach, South Carolina, in sorting out the confusing and obscure literature for this species.



Helix stuartiae Sowerby, 1845 from *Manual of Conchology*, 2nd series, Vol. 2, Plate 18, fig. 61 (from Kuester, *Conch. Cab.*, t.54, f.10)

The End of an Era

by Kim Hutsell



The original "Sunny Jim" cave structure, 1903.

Undoubtedly, there are few places in Southern California more picturesque than the wave battered sandstone cliffs of La Jolla's north shore. Over the millennia, the water has carved out arches, buttresses and sea caves, giving the area an almost cathedral-like appearance. But, beautiful as it may be, the cliffs and caves can be a perilous place for the unwary. The heavy surge and unpredictable surf have claimed the life of more than one poor soul who became trapped between the rocks and the crushing waves.

It was probably the inaccessibility of these caves from the seaward side which prompted a German professor to begin digging a tunnel from the land side in the year 1902. Armed with nothing but a pick, a shovel and determination, he began digging, hoping to penetrate the largest of these caves from the back side. Late in 1903, the tunnel was completed and several months later, steps were set in place. Then, in 1904, a two storey structure was constructed over the entrance to the tunnel and the cave was opened to the public.

Throughout the years, many tales have been told about the cave. For a while during the prohibition era, the cave was reportedly used by bootleggers. Other tales speak of smuggling more sinister cargo such as guns and illegal immigrants. Whether the tales are true or not, the cave was known briefly as "Smuggler's Cave." The site also caught the attention of Hollywood studios in search of unique locations and they used it as a backdrop for scenes in several movies. The view from inside the cave looking out through the mouth at the open sea provides the observer with a crisp silhouette of an old bearded

sailor. Many believe that it was the likeness of this silhouette to the British cartoon character "Sunny Jim" which inspired the name it bears today, the Sunny Jim Cave. So well known is this landmark, in fact, that it is even listed in the Encyclopedia Americana as one of the "must see" sights in Southern California.

On January 1st, 1978, Don and Jeanne Pisor leased the first floor of the structure which sits atop the entrance to the Sunny Jim Cave and opened The La Jolla Cave & Shell Shop. The shop had a delightfully rustic atmosphere with bare, time-worn hardwood floors, a breath-taking view of the bay and the smell of the sea wafting up through the tunnel from the cave below. They crammed the shop with all kinds of unique curiosities from tourist trinkets to t-shirts, from art pieces to postcards, but mostly with seashells from around the world. And, for fifty cents, visitors could climb down the 145 steps leading to the sea cave at the base of the cliffs to marvel at the view.

Over the following two decades, the La Jolla Cave & Shell Shop went from being just another quaint little shop to becoming a landmark known quite literally around the world. Tourists and shells collectors from every continent came to La Jolla for no other reason than to visit the Pisors' shop, to make the descent into the cave, to be thrilled by the view and the sea surging up into the mouth of the cave, then to re-emerge into the shop where they could buy some remembrance of the experience. Many of the locals who first came to the shell shop as children would return time and again and eventually bring their own children to see what they had come to know as a permanent and cherished fixture of their community.

On Labor day of 1998, that all came to an end. The new owner of the cave property decided not to renew the Pisors' lease, stating that he had been told by unnamed sources at such institutions as Scripps Institute of Oceanography that there was "a problem with selling seashells — that 'shell miners' were responsible for the reef destruction all over the world." Misinformed as this reason might be, the La Jolla Cave & Shell Shop was forced to close its doors for the last time after twenty years of continuous business. Although the Pisors still own the Seaport Village Shell Company on San Diego's waterfront, there will never be another shell shop like the La Jolla Cave & Shell Shop.



La Jolla Cave and Shell Shop, 1997



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THE BRAZILIAN CONNECTION

Let's Go Shelling in Brasil — Part II

by José Coltro



Conus bertarollae Costa & Simone, 1997 (20-24 mm). This cone can be found at the Abrolhos Marine National Park near Caravelas. (Photo by Marcus Coltro)

In Part I, (*AmConch*, June, 1998) I described the central-southern Brazilian coast. Here our trip starts north of Vitoria, in the state of Espírito Santo. Just across the Rio Doce, the shoreline becomes very wild. Most of the coast is a desert beach with coconut trees or large mangroves. Some places are gorgeous, like Conceição da Barra which is the last city in the Espírito Santo, Nova Viçosa, Caravelas and, especially Porto Seguro, all in the State of Bahia. Porto Seguro was the place where the Portuguese discovered Brasil in April 1500. The city has a very nice colonial architecture and the beaches are wonderful. Today it is one of the most visited places on our coast.

From there or from Caravelas it is possible to take a boat to visit one of our Marine National Parks: Abrolhos. This park is a group of small islands with hundreds of reefs. It is an adventure to go there. The boat has to go between shallow reefs and the sea is not very friendly. In this park, Dr. Edward Petuch found some of those fantastic species that he described in the late 70's, species like *Plicoliva zelindae* and *Conus abrolhosensis*. Recently, from this area my diver Alfredo Bodart found a nice new cone, *C. bertarollae* Costa & Simone, 1997 and a new marginellid that will be described very soon. Between Caravelas and Porto Seguro, there is the Monte Pascoal National Park — one of the best reserves of the Atlantic Rain Forest. From the park one can experience the first view of Brasil that the Portuguese saw 500 years ago. And the most fantastic aspect of this park is that the place is just as it was then! Some natives still live there.

Going north, the coast is wholly desert until you reach Comandatuba, where a great resort was built on an island. Ilheus is the next large city and the Brazilian capital for cacao for over a hundred years. The architecture is really nice. Around the city, with permission from the farmers, one can look for land shells in the cacao area. Since the cacao tree needs the shade of larger trees, the local tropical forest was preserved and it is possible to find great land shells like *Auris ilheocola* (Moricand, 1836), *A. bernardi* (Pfeiffer, 1856), *Polygyratia polygyrata* (Born, 1778) and *Neobeliscus calcarius* (Born, 1778).

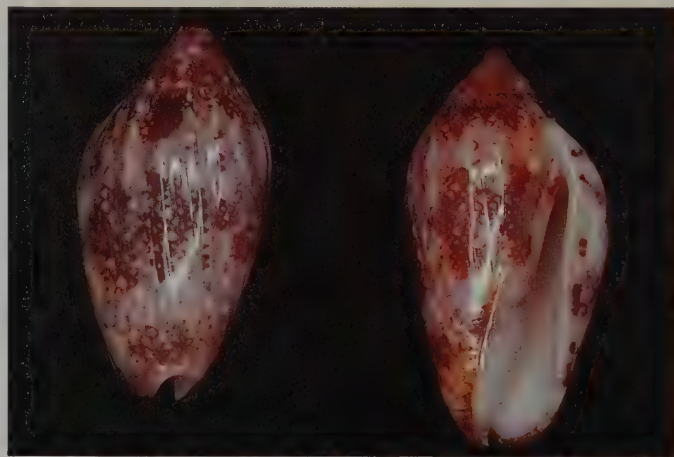
CX. P. 15159, Sao Paulo, CEP 01599-970 Brasil
Email: Femorale@br.homesshopping.com.br

Marcus and I found the first live *Obeliscus obeliscus* (Moricand, 1836) since 1920. The shell was considered extinct.

North of Ilheus, many large islands and mangroves appear. In the Tinharé Island are many gorgeous reefs, especially around Morro de São Paulo, one of the best points on the whole Brazilian coast to dive. The next large island is very well known to us: Itaparica. Marcus and I had some of our best vacations there. The island has a very old village, Porto de Itaparica, where one of our best friends, Bernardo Linhares, has a very old house. The sea there is very calm and very warm. It was at Porto de Itaparica that we found the first *Chicoreus coltrorum* (E. Vokes, 1991). Lots of *Cyphoma macumba* Petuch, 1979 and many other shells are found at very shallow water. Two other nice villages in the island, Maré Grande and Barra do Gil, are great areas for research in coral reefs.

As you cross the Todos os Santos Bay, you reach the city of Salvador, which boast some of the most beautiful beaches and architecture. Salvador was the first Brazilian capital. The Portuguese founded it in the early 1500's. The city has over 300 churches, some with the interior covered by gold. The people are very friendly and they are very, very calm. There are no rushes! The city has 4 million people, but it seems that all of them are at peace with life. It is very different from any other city in all of Brasil. The culture, food and life styles are really unique. There is much African influence in everything. Salvador is also a great location for shells. Some of the best spots are the Porto da Barra beach, the Yacht Club harbor (my favorite) and Itapuã Beach. Lots of species are found just at low tide in tidal pools. One can find species like *Bullata largillieri* (Kiener, 1841), *Babelomurex mansfield* (McGinty, 1940), *Cypraea acicularis* Gmelin, 1791 and *Cypraea cinerea brasiliensis* Lorenz and Hubert, 1993. Just 50 miles north of Salvador there is one of the best resorts in Brasil: Praia do Forte. If you like a nice reef, turtles every night on the beach, nice shells, and comfort, this is a great place.

Following the Coconut Road, the next state is Sergipe. The smallest Brazilian state has very large bays with many mangroves. The next State is Alagoas, with the very nice city of Maceió. With gorgeous beaches and reefs, it is a great place for snorkeling. You can find small specimens of *Voluta ebraea* (L., 1758), right in very shallow water. Off Maceió there are many very shallow reefs where you can find some — not many — shells. Large *Conus regius* Gmelin, 1791 or nice *Turbinella laevigata* Anton, 1839 are found there. North of Maceió a large series of villages with wild beaches continues clear to the big city of Recife, in the state of Pernambuco. One of these villages deserves a visit — Porto de Galinhas. Around the village you can find some of the best resorts with private beaches or reefs! You can obtain some good material from the fishermen, too.



Plicoliva zelindae (Petuch, 1979). The rare and beautiful Brazilian volute looks a lot like an olive with a pleated body whorl. (Photo by Marcus Coltro)

Recife is a very large city with over 3 million people. It is called the Brazilian Venice. The best beach is Boa Viagem, but be aware — it is the place with the most shark attacks — they could have some great shells: perhaps spiny *Vasum cassiforme* (Kiener, 1841) or colorful *Strombus gallus* L., 1758. Just outside Recife, there is the historical city of Olinda. One of the oldest Brazilian cities, this small port has great architecture.



Two Brazilian landshells from around the cacao plantations in Bahia. Compare *Auris ilheocola* (Moricand, 1836) (60 mm) on the left with *Auris chrysostoma* var. *swainsoni* Pfeiffer (54 mm) on the right. (Photo by Marcus Coltro)

The next large city as you travel north is João Pessoa, in the state of Paraíba. In Cabedelo, in the João Pessoa port, you can find some of the most beautiful and largest *Cassis tuberosa* (L., 1758) you ever saw. Most of the Paraíba beaches are hard to reach and because of this they are wild and very nice. The coast will remain this way until Natal, the capital of the State of Rio Grande do Norte.

Rio Grande do Norte has some great spots to dive. Most of the reefs are 10 or 20 km off the coast and they are completely wild. In 1997, Luiz Couto went there to dive and he found some wonderful shells, like live *Morum matthewsi* Emerson, 1967, *Ancilla faustoi* Matthews & Matthews, 1978, *Conus selenae* Van Mol, Tursch & Kempf, 1967 and others. The great problem is how to get there. It is impossible to find a good diving boat. You have to try to convince a lobster boat to take you there. You have to pay very good money for that, but cost is not the only problem. The truly bad thing is the dive equipment: TERRIBLE! It is an unpleasant adventure, even if you find great shells. But if you want to try, look for the boats in Natal, Macau or Areia Branca.

The next state north is Ceará. Today, this is one of the best states for tourism. Fortaleza is the capital and the major city, modern, clean, with nice hotels. Most of the shells there you'll find with the fishermen at the market. You may find a *Cypraea surinamensis* Perry, 1811 or large *Strombus goliath* Schröter, 1805. Most of the Ceará beaches are open to the ocean and the water is not really clear. Very few spots will permit you to snorkel or dive. But if you have an opportunity to rent a boat and go very far from the coast you'll find some great shallow reefs — about 10 or 20 meters deep. I got shells from this area only once, 10 years ago: two huge *Conus ermineus* Born, 1778, both over 120 mm, that I sent to the Oceanographic Museum of Rio Grande. The very rare *Conus scopulorum* Van Mol, Tursch & Kempf, 1971 was found in this area, too.

As we leave the Ceará State the Brazilian coast starts to change drastically. The delta of the river Parnaíba is pretty much the last of the

sand beaches. Here, on the border of the states of Piauí and Maranhão, a huge area of mangroves starts to appear. Muddy sand beaches or huge dunes areas are quite common. One of these areas is the great National Park of Lençóis Maranhenses — probably one of the largest dune areas in all the Americas.

São Luís, the Maranhão capital, is one the oldest Brazilian cities, founded by the French during the XVI century. Like Salvador and Olinda, it is an UNESCO World Cultural Heritage Site. The city is on a large island in a muddy bay. With huge tides, the muddy sand beaches are really large and it is possible to find some *Natica*, *Nerita*, and especially *Thais coronata* (Lamarck, 1822).

Between São Luís and Belém, in the Para State, the Brazilian coast is completely full of bays and mangroves. Very few people live in this area and it is impossible to go by land transport to most of the localities. One of the few places you can go by car is Salinópolis, considered the last true "salt-water beach" on the Brazilian coast, because beyond this village the Amazon River influence is immense.

I went to Salinópolis in 1986 and it was one of my memorable trips. The village has one or two very small hotels and the city beaches are really muddy. I had some truly bad times walking there. I had mud up to my abdomen one day! And I found very few shells, nothing but *Thais coronata*, *Nerita* and *Neritina*, and some bivalves. Just a few kilometers south of Salinópolis there is an extremely long beach called Praia do Atalaia. Most of the beach is desert — one side is the sea and on the another side is the Amazonian forest. I saw one of the most incredible tides of my life. The sea receded more than 20 km. It was like a huge white flat desert. It quite dangerous to walk there because when the tide comes back, you are not able to see where the original beach is. Many people have died there because of this immense tide — they walked miles to go to the water and on the way back they lost their sense of direction. It really happens easily, especially because all the land is very low, almost the same sea level. But I found some *Oliva scripta* Lamarck, 1810 and some other small shells.

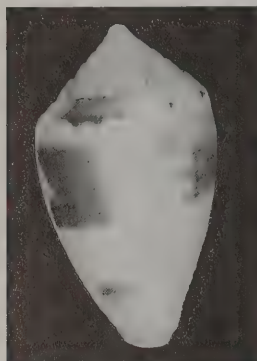


Obeliscus obeliscus (Moricand, 1833). This 70 mm Brazilian landshell comes from Pimenteiras, Bahia State, Brasil. (Photo by José Coltro)

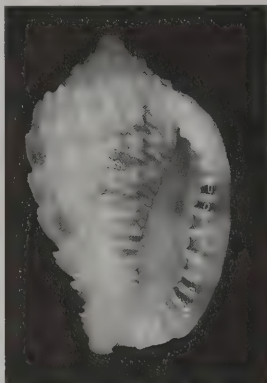
Going north, the Amazon River's influence is so intense that the sea is not a real salt sea, but a fresh water sea. One can notice the fresh water up to three or four hundred kilometers off the coast. Most of the upper level of the sea is fresh water, but on the bottom the salt water is still there and so shrimp boats should be a great source of shells. Unfortunately for shellers, though, they have changed the way they trawl and they no longer touch the bottom, and so they get few shells. In the Amazon delta there are hundreds of islands. One of those islands is Marajó. This huge island, bigger than Denmark, is an incredible world, full of mangroves, dense forest, wild buffalo and one of the most incredible pre-Colombian cultures, with many archeological

sites. In the main village of Soure, it is possible to find millions of *Neritina zebra* (Bruguière, 1792) at low tide.

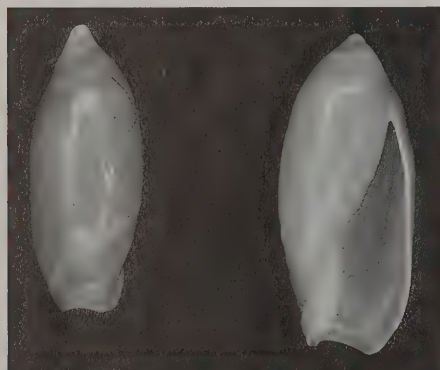
The last (or the first?) Brazilian state is Amapá. With a long coast, completely covered by mangroves, it is here that one of the most incredible natural phenomena occurs, the *pororoca*. On occasion, the sea invades the coast with huge waves which sound and look like a thunderstorm, and they destroy most of the coast. The amazing *pororoca* occurs during the rainy season.



Conus selenae Van Mol, Tursch & Kempf, 1967. A well-marked specimen of this uncommon little cone. (Photo by Marcus Coltro)



Morum matthewsi Emerson, 1967 (27mm) from Rio Grande do Norte. (Photo by Marcus Coltro)



The beautiful golden *Ancilla faustoi* Matthews & Matthews, 1978 (18 mm) from Rio Grande do Norte, Brasil. (Photo by Marcus Coltro)



Porto da Barra Beach, Salvador, Bahia State. One of our favorite spots in Salvador to shell.



A lovely old city in Bahia State, Porto de Itaparica on Itaparica Island.

Tulane Studies Is No More

Tulane Studies in Geology and Paleontology is having a Going Out Of Business Sale! With the retirement of its Editor and mainstay, Dr. Emily Vokes, *Tulane Studies* will cease publication with the publication of volume 30, no. 4 (Taxonomic Index to Volumes 21-30). All numbers are currently in print, although a few are becoming scarce. As a special offer, as long as they are available, a complete set of volumes 1-30 will be available at one-half the list price, or \$244. Single issues will continue to be sold at list price (inasmuch as it costs over \$1.00 to

mail one copy!) Foreign orders need to add \$20.00 toward the postage for a complete set.

Tulane Studies contains most of Dr. Vokes' work on the Muricidae of the western Atlantic as well as many other pertinent and important articles on mollusks of other groups by Drs. Emily and Harold Vokes and other workers in malacology.

To order, send a note with your request and a check made payable to *Tulane Studies in Geology* and send it to *Tulane Studies in Geology*, Department of Geology, Tulane University of Louisiana, New Orleans, LA 70118 USA.

COA Awards \$5,450 in Grants to Malacology

by Gary Rosenberg

The educational grants committee for 1998 consisted of Dr. Henry Chaney, Dr. G. Thomas Watters, and Dr. Gary Rosenberg, as in the preceding two years. We received 28 proposals with requests totaling \$41,243, compared to 35 proposals totalling \$44,882 in 1997 and 29 proposals totalling \$32,685 in 1996. Seven proposals were funded, including Fabio Moretzsohn's proposal on the *Cypraea cribraria* complex of species, which is the winner of this year's Walter Sage Award. The Grant winners, Ph.D. candidates all, are listed below:

***Rachel Collin, University of Chicago, \$1,000**

"Systematics, life history, evolution, and development in *Crepidula*." Species of *Crepidula* (slipper shells) have a variety of types of larval development, ranging from planktonic veligers to young that hatch at the crawling stage. This study proposes to test ideas for the origin of the developmental types by collecting detailed information on life histories of *Crepidula* and integrating it with knowledge of the evolutionary relationships of the species. This should show whether particular larval types have evolved once or many times within the genus.

***Jason P. Curole, University of New Hampshire, \$580**

"A test of the neutral theory: molecular evolution of gender associated mitochondrial lineages in unionacean bivalves." Mitochondria are small organelles in cells responsible for storing and releasing energy. In most organisms, the mitochondria are inherited only from the mother, coming directly from the egg. In some bivalves, mitochondria are also inherited from the father, coming from the sperm. This study aims to discover if there are different evolutionary patterns in the male and female lineages in the unionid bivalves.

Academy of Natural Sciences, 1900 Benjamin Franklin Parkway, Philadelphia, PA 19103-1195 Phone: 215-299-1033 Email: rosenberg@say.acnatsci.org

***Lisa S. Gardiner, University of Georgia, \$1,000**

"Caribbean mollusk communities of coral reef environments: an investigation of community stability through Pleistocene time." Caribbean reef communities are known to have been stable over geological time, but it is unknown if mollusk communities show similar stability. Comparisons of mollusk communities in fossil reefs in the Bahamas should reveal whether evolutionary patterns differ between mollusks and the coral reefs they occupy.

***Erika Iyengar, Cornell University, \$840**

"Why work when you can steal? Kleptoparasitism in a marine snail (*Trichotropis cancellata*)." *Trichotropis cancellata* has two feeding modes, filter feeding, in which it traps particles of food in mucus on the gills, and kleptoparasitism, in which it steals food from tube dwelling polychaete worms. This study will address how the animal determines when to switch between the two feeding modes.

***Steve Lonhart, University of California, Santa Cruz, \$730**

"Invasion of Monterey Bay by Kellet's Whelk: the role of coevolution and functional feeding mode in determining invader success." Around 1980, the whelk *Kelletia kelletii* expanded its range northward, invading Monterey Bay, California. This study examines the interactions of native prey species and the new predator.

***Dwayne Minton, University of Hawaii, \$300**

"Distribution and migration patterns of tropical rocky shore molluscs." The study will test the relative importance of wave impact, temperature, and predation in controlling the distribution and migration patterns of various mollusk species on a rocky shore in Jamaica.

***Fabio Moretzsohn, University of Hawaii, \$1,000**

"Species boundaries in the *Cribrarula cribraria* species complex (Gastropoda: Cypraeidae)". Molecular, conchological and anatomical data will be combined to define species boundaries in the *Cypraea cribraria* species complex, which includes *C. catholicorum*, *C. cuminigi*, *C. astaryi*, *C. taitae*, *C. gaskoini*, *C. cribellum*, *C. esontropia* and a number of subspecies and races.

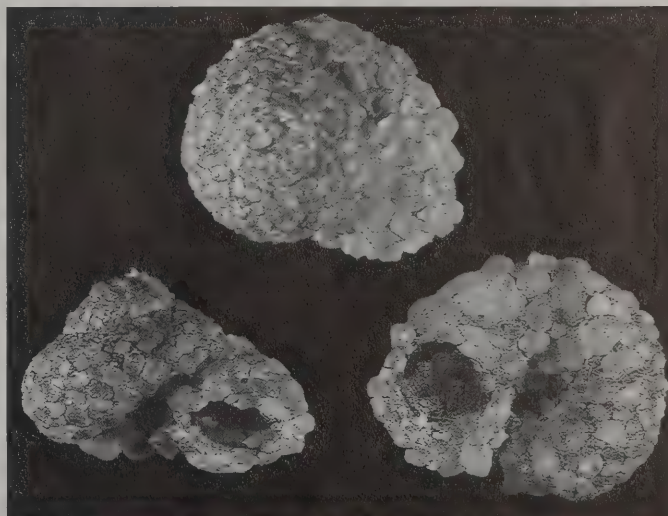
Imitation Is the Sincerest Form of Flattery

by Ross Gundersen

We were visiting my brother and sister-in-law at their cabin on Lizzy Lake in northern Minnesota. Of course my passion for shell collecting got the better of me. Off came the shoes and I went wading, happily looking for shells. I lifted a small log off the bottom and discovered some small snails, about 8 mm in diameter, which had the look of a turbo. I preserved them in alcohol and I didn't think about them again until I got home. I was very surprised when I observed these snails with my microscope. The shells were made up of grains of sand, which increased in size from the apex to the aperture. Within the aperture there was what appeared to be an operculum. Needless to say I did not think that these were really snails. While I was pondering their identity, some of my graduate training in entomology percolated to the surface of my brain. These imitation snail shells were really the larval cases of an aquatic insect! The insect which produces these is a larval caddis fly of the genus *Heliopsyche*. Inside the exquisite imitation snail shell is a rather ugly, depending upon your point of view, larval caddisfly. The operculum-like structure is a simple trap door attached to the side of the aperture and has no attachment to the insect within.

Twenty years ago (my entomological period) I would have thought the snails were imitating larval *Heliopsyche*. Since then my interests have shifted to malacology. Now I think that *Heliopsyche* is paying the sincerest form of flattery to snails by imitating them.

Department of Biological Sciences, Wisconsin University, Parkside, Box 2000, Kenosha, WI 53141 Email: ross.gundersen@uw.edu



The *Helicopsyche* larval case is made of grains of sand.

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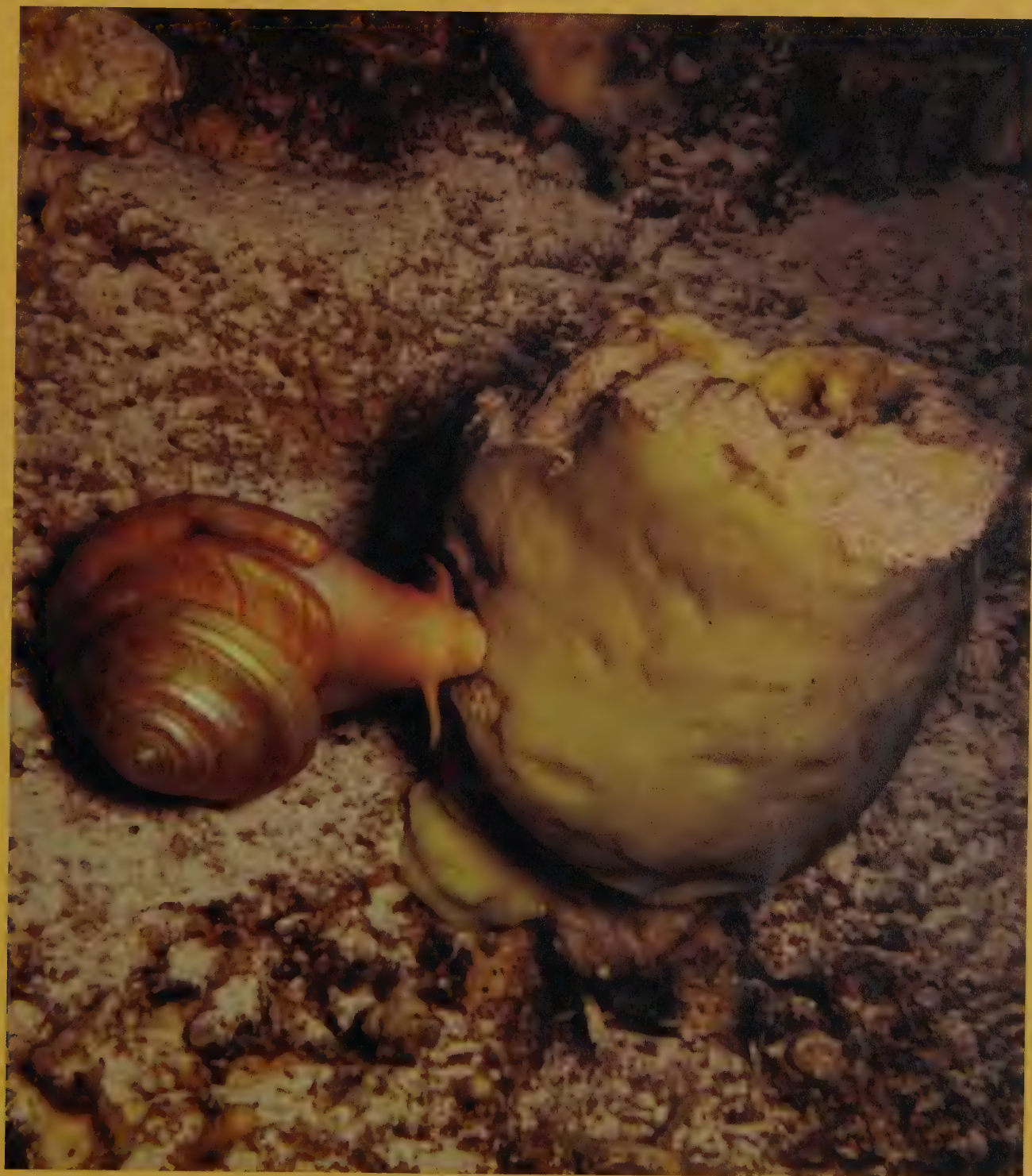
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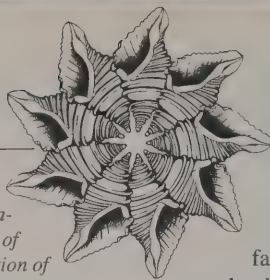
QUARTERLY JOURNAL OF THE CONCHOLOGISTS OF AMERICA, INC.

VOL. 26, NO. 4

DECEMBER 1998



CONCHOLOGISTS



OF AMERICA, INC.

VOL. 26 No. 4 DECEMBER 1998

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: *Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.*

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MEMBERSHIPS are for the calendar year, January-December, late memberships retroactive to January. **1999 DUES:** (USA, Canada, Mexico) \$20.00; Postal Surcharge: \$10.00 for other Western Hemisphere nations; \$12.00 for Europe; \$15.00 for Asia, Africa and the Pacific Rim. Please pay in U.S. dollars, or on check with Transit Enrouting and Account Numbers printed at the bottom, or with money order; make checks payable to CONCHOLOGISTS OF AMERICA. **NEW MEMBERS** apply to Doris Underwood, **MEMBERSHIP DIRECTOR**. **RENEWALS** go to **TREASURER**, Bobbie Houchin. **BACK ISSUES** are available from **PROPERTIES DIRECTOR** Hank Foglino, 4 Trent Court, Smithtown, NY 11787-1266. Prior to 1985 \$3.00 each; 1985 to current \$5.00 each.

PRESIDENT'S MESSAGE

I must confess. When I heard that the 1999 COA Convention might be held in Louisville I thought, that's too far inland. Then, before I could say "neigh," it came to me that we shouldn't look a gift horse in the mouth. After all, in 2000 we'll be inland in Houston — but that's a horse of a different color.

A question did arise, "How will we get the members that far inland for shells?" You know, you can lead a horse to water but you can't make him drink. To get you interested we found some real workhorses in Louisville. The starting gate is packed with new racers and old favorites. From the Shell Derby to the Banquet, this winners' circle is loaded with roses. And this is straight from the horse's mouth!

For those of you who are waiting for a president's message, hold your horses. We need to use some horse sense and go at a steady trot because we don't want to start at a gallop. That could cause us to get the cart before the horse before we get to Louisville.

Enough of this horsing around! Here's the president's message: Get off your high horse and meet us in Louisville this summer.

Gotta go, I'm so hungry I could eat a horse.

Linda Brunner
President, COA

IT'S CONVENTION DONATION TIME AGAIN!

That convention in Louisville is heading down the stretch and it's time to dig into those duplicate files and those leftovers from your shelling trips and make a donation to the annual COA Auction. The auctions are the second most important source of income for the organization. As membership dues (the largest money raiser) basically cover only the cost of printing and mailing your issues of *American Conchologist*, the auctions have to fund all other activities of the organization, including our Grants Program. Last year's event was in record setting territory and we hope to be there again in 1999. But we can't do it without your donation. We welcome any type of donation from shells to books to shell related items and shell craft. The auction committee reserves the right to assign your donation to either the silent or bid auction.

Send all donations to Jim Brunner, PO Box 8188, Southport, FL 32409 and the earlier the better, because it takes me forever to get them all logged. Just a personal thought: As it is Louisville, Horse Conchs should be a hot item this year!

Call For Speakers

This is the second call for speakers for the 1999 Convention in Louisville. COA is looking for programs and presentations for the 1999 Convention in Louisville, Kentucky. All programs should be conchologically informative (no pure travelogues, please), well illustrated, and of general interest. Each program should be 20-30 minutes in length, including time for questions. Please mail a brief abstract/description of your planned presentation to Tom Watters, our Program Chairman for 1999. Please don't email your program information.

Tom Watters
Ohio Biological Survey
Ohio State University
1315 Kinnear Road
Columbus, OH 43212 USA

COVER CREDITS: Dr. Jerry Harasewych of the Smithsonian has much experience with deep dives, and with the Pleurotomariidae. He shares with us his photo of *Perotrochus midas* F.M. Bayer, 1965 dining on a sponge. The specimen was collected in 695 m off Riding Rock, San Salvador, Bahamas. It was taken from a Johnson-Sea-Link sub. (See book review on page 10.)

COME TO KENTUCKY!

by Convention Chairman Gene Everson

The 1999 COA convention, to be held in Louisville, KY June 27-July 1, is, in a way, a protoconvention: there is no shell club to play host and to provide workers for the event. Many of the convention committees for next year are instead being headed by COA members who live out of the area. If we can make a success of this new kind of convention, we feel that the future holds unlimited possibilities for convention locations.

Here's the way this will work: Bourse Chairs Charlotte Lloyd of Jacksonville, FL, and Rich Goldberg of Columbia, MD, will work with the shell dealers and organize the Bourse. Hard-working Charlotte will be our convention photographer, and she will also be in charge of running the Silent Auction sessions at the Convention. Jim and Linda Brunner, in Panama City, are Auction Chairmen, and will be accepting donations and organizing the Silent and Oral Auctions. Program Chairman is Dr. Tom Watters in Columbus, OH. Karlynn Morgan in Naples, FL is heading up Registration. And many COA members are arriving a day early to help open the event, or to assist with the many tasks that will need volunteer power during that wondrous week next June. So plan to join us, to help out or just to have a great week enjoying shells! Either way, you'll be helping COA take this next step toward its future.

We are delighted to announce that our Banquet Speaker will be Dr. Emily Vokes, the world renowned authority on the Muricidae. She is recently widowed; Dr. Harold Vokes passed away September 16, (see p.22) but with her characteristic and remarkable enthusiasm for life, Emily is jumping right back into her love of shells and COA!

Our Welcome Party will offer a little different format. Our convention hotel, The Galt House, has over twenty restaurants within walking distance, and the free Toonerville Trolley can take you to others, so we encourage you to sample the local cuisine on Sunday night

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before the Welcome Party begins. But save a little space for a treat: our new-style Welcome Party will be offering a sampling of delicious gourmet desserts. Enjoy them with coffee or liqueurs and drinks from our cash bar while you listen to some local Bluegrass and chat with old friends. This event will be held in a magnificent and newly restored historic room at Actors Theater, just around the corner from the Galt House.

An immensely popular event that is being resurrected at COA 1999 Louisville is the Bargain Table. Early arrivals on Saturday afternoon will find a table heaped with specimen shells, all bagged and with data slips, for sale at \$.50 per shell. The shells for this event are being furnished by donation, so if you have something to donate to the Bargain Table or to the Auctions or the Raffle, please send them at your earliest convenience. (Auction items go to Jim Brunner, and Bargain Table items come to me.)

Saturday's a great day to arrive anyway if you are flying because it gives you price breaks on airline fares. (Didn't I mention that this was to be an affordable convention?) Also there's so much to see and do in Louisville that you're going to want every extra minute: legendary Churchill Downs, home of the Kentucky Derby; the J.B. Speed Art Museum, free, and newly renovated with help of a huge bequest; the IMAX theater with its latest eye-popping films; the antique treasure trove that the hundreds of Louisville Antique shops offer. Oh, and have we mentioned Cave Hill Cemetery? Well, more about that later, maybe.

As an added enticement, there's going to be a World Record Size Event, Parade of Champions. If you are the proud owner of one or more World Record Size shells, you'll want to make plans to attend to show off your champions. More about that later too.

Enclosed in this issue you'll find two important inserts: the first is your registration form for the Galt House Hotel. Be sure to make your reservations early! Some of the bigger suites are in limited supply. You'll also find a registration form and rules for the one, the ONLY, the Great COA Shell Derby!

Come to Louisville, KY - your kind of place

BOARDTALK.....

From Bobbie Houchin, COA Treasurer: This short report is to keep you informed about the COA-Walter Sage Funds. As of October 31, 1998 the COA-Walter Sage Fund #1 (Contributions) balance is \$4,364.42. The COA-Walter Sage Fund #2 (Fabric Sales) balance is \$10,191.93. The two funds have a grand total of \$14,556.35. So far \$1,225.00 in Grants has been given and grants will continue to be awarded to approved recipients in the Malacology field.

If you would like to make a holiday contribution in Walter's memory, please make your check payable to C.O.A and designate on your check for COA-Walter Sage Fund #1. Mail it to Bobbie Houchin, COA Treasurer, 2644 Kings Hwy, Louisville KY, 40205-2649. Increasing the principal in the funds and reinvesting the interest allows the Walter Sage funds to grow, to make more grants to malacology possible.

From Doris Underwood, COA Membership Director: In the September issue of the *American Conchologist* a renewal form for 1999 dues was enclosed. We sincerely thank all those who have sent in their renewals early. Dues are very important as they provide a major portion of funding for production of *American Conchologist*.

Most of us slit open the envelope when the magazine arrives to get

right into reading. Before tossing the envelope, take a moment to check the address label. Make note of the letters in the upper right hand corner. Within the United States, "B" stands for BULK MAIL and "FC" for FIRST CLASS. Bulk Mail travels more slowly and can often take several weeks to reach its destination.

Also, it is very important to understand that Bulk Mail is not forwardable. So if you have moved, even temporarily or seasonally, your magazine will not follow you unless you send us a change of address.

The date next to the letters indicates the year your membership is paid through. However, during this renewal period at the end of the year, there can be a small time lag in our processing incoming dues. If we received your 1999 dues after the mailing labels were printed in mid-November, the date on the December issue envelope may not accurately reflect your current status.

For our members outside the United States, only the year paid appears.

If you have a change of address or other status, please send it to my attention: Doris Underwood, COA Membership Director, 698 Sheridan Woods Drive, West Melbourne, FL 32904-3302. (407) 724-2449 underwood@yourlink.net

Happy Holidays to all.

THE SOLOMON ISLANDS AND THEIR TREE SNAILS

by "Henry A. Martens"

There is a fascination in the concept of snails living in trees. I've seen flying squirrels, flying foxes, flying fortresses, Tasmanian devils, and Komodo dragons, but TREE snails! I was told that a great region to see these creatures is the Solomon Islands. I expected to see tree snails hanging by their feet and bellowing threatening cries as they swung from branch to branch to escape the pursuit of Tarzan. But, unfortunately, this was not what I saw.

The Solomon Archipelago is northwest of Fiji and Vanuatu and southeast of New Guinea in the southwestern Pacific. It consists of two northwest-southeast trending island chains. During World War II the place names in the archipelago became household words, names like Bougainville, Guadalcanal, and Henderson Field.

My reason for going there was to observe and study the landsnails. In January of 1997 our group of sixteen spent seven days at Munda on New Georgia Island and seven days on small Ghizo Island a short distance to the northwest. The two sites were quite different. Munda is on the coast of large New Georgia Island (85 by 41 km with an area of 2,145 sq km), and still has areas of primary forest. Ghizo is a small island (11 by 5 km) that has been entirely clearcut.



Dendrotrochus meridionalis has a dark brown unicolor shell. The animal is cream with a reddish patch behind the tentacles. Ghizo — Over the Top Road. 13.8 mm.

—**Munda:** From the Munda airport we walked across the road a few steps to the coast and the Agnes Hotel. Anxious to go collecting, I went walking after check-in and before dinner. In a wooded area at the east of the airport I found the yellow *Leptopoma perlucidum*, the large, flat-topped *Chloritis eustoma*, the striped *Dendrotrochus cleryi*, the unicolor operculate *Ceratopoma spinifera*, and a flat, wide, uniliculate shell with spiral sculpture, *Trochomorpha xiphias*. Altogether, the eleven species I found was a good start before dinner!

We were taken on a "tour" of Munda by one of the chiefs. The tour may have been required if you stayed at the hotel. The town, consisting of several named "districts," is spread for six kilometers along the coast. We ended our tour in the district of Bangana.

Along the inshore side of the road is a dump of World War II surplus military equipment — a mountain of rusting metal. Between the ocean and the village is a huge concrete pad supported by old 44-gallon cement-filled petroleum drums. The pad once housed several quonset huts used as wartime sheds. The area was known as the Bond Store. At the west end is a small, reinforced-concrete hut where the paymaster kept the soldiers' wages until payday. On this pad the local

??????



Papuina vexillaris shells frequently have bluish or greenish algae on the surface. New Georgia — Holupuru Falls. 28 mm.

natives had mostly marine shells to sell, but I bought from the chief a few of the many *Placostylus strangei* for sale. The shells were all adult but in various stages of growth; some had a developed parietal tooth and others did not. They make a great growth series.

One night we had entertainment after dinner. Fifteen young singers, two guitars, and bamboo pipes provided music. They had a hand-written songbook but no musical notes. The bamboo pipes consisted of three vertical rows with eight long stems in each row. The bottom right-hand pipe, the longest, was eight feet long, the one above, seven feet, and the top, six feet. The pipes got shorter on the left side. A man used a coconut shell to "play" the pipes. (In Papua New Guinea, a rubber sandal was used for the same purpose.)

—**Mbareke:** With my guide and a ride next day, I visited a second-growth forest (elevation 200') in the Mbareke area northeast of Munda. Here I found fourteen species, including some of the ones I'd found the day before, plus *Placostylus strangei*, *Papuina gelata maddocksi*, *Papuina vexillaris*, and *Ceratopoma fischeriana*. I also found *Setaepoma hoodi* which resembles a small *Leptopoma*. *Setaepoma* is a genus endemic to the Solomons.

On the ground in the forest was a small piece of metal, a dog tag from World War II. It differed from other dog tags I had seen by having the name and address of the next of kin on it. I wrote to the National Personnel Record Center for data, but the Privacy Act of 1974 prevents the release of any information.

In front of a house along the road was a fire pit containing a few broken, empty *Telescopium telescopium* shells. I was told the entire shell of this large marine mud snail was put into the fire and cooked. When "done," the shell was broken and the animal removed and eaten.

—**Polo Viso Hills:** I visited the top of the 250 foot Polo Viso Hills north of the airport. We walked along the ridge road and took side



Partula flexuosa belongs to a widespread South Pacific genus but is an endemic species. Ghizo — Gizo Forest Park. 17.5 mm.

paths. The second growth forest consisted of small trees, maximum 6" diameter, with a fern understorey — a very pleasant area. I found *Placostylus strangei* and *Partula flexuosa* plus sixteen other species.

—**Roviana Island:** We took a fifteen minute windy boat ride to Roviana Island. We were met by our guide, Bai, an older man who spoke little English. The island had some elevation (200') but had been cleared and burned. Most of the vegetation is young trees about twenty feet tall with a pandanus understorey. About 200-300 people live on the island. We walked up to the summit and then down and back to the village. We saw the remains of a Japanese airplane. We also found eight species, including *Smeatonia eddystonensis* and *Solmogada flexilabris*.

The notorious headhunter Ingava ruled from his coral-walled fortress on this island until 1892 when the fortress was destroyed. His tribe had a wild dog as its totem, and they worshiped a rock carved like a dog before going on headhunting forays. The fortified village consisted of layers of coral, with the Dog Rock on top. The fortress was thirty meters wide in places. There is still over 500 meters of coral wall remaining, though the forest has now covered much of it. The Dog Rock is still there, but now it's broken.

I was told that the path to the stronghold was lined with shells to give warning of any intruder's approach. How did the shells warn of intruders? Were they suspended and bumped, or were they thin shells that would crush and cut the invaders' feet? In 1887 Guppy noted that the natives on Guadalcanal gathered dead *Placostylus cleryi* (some

over 100 mm long) and placed them along the forest path. "He was never able to learn the reason for this particular practice." Was this a similar warning system?



Solmotella fringilla has variable shell patterns (multiple stripes, unicolor) but always has a red aperture lip. New Georgia — Holupuru Falls. 22 mm.

—**Holupuru Falls:** We left in the morning with our guides and rode for twenty minutes to the Holupuru Falls trail on the Mburape River. The weather was clear and pleasant. The trail started in second growth forest which included banana plants, and ended in a primary forest with spiny palms and a few bananas. On the higher leaves were snails, many kinds!

These included *Chloritis eustoma*, *Dendrotrachus cineraceus cleryi*, *Helixarion malaitaensis*, *Placostylus strangei*, *Trochomorpha xiphias* and *T. zenobia*, and five Papuininae: *Papuina gelata mad-docksi*, *P. lienardaris*, *P. vexillaris*, and *P. species*, and *Solmotella fringilla*.

Above the falls was a two foot diameter log across a wide pool. I didn't realize the log was floating. When I stepped on it, it moved and I fell in, feet first. The water was waist deep and my camera was, fortunately, above water. The bank was vertical so I had no footing to get out. A logger who was across the river came over and pulled me out.

He had recently cut down a big rosewood tree. I looked through its foliage for tree snails but didn't find any *Placostylus*. I saw a few shells on the ground and assume they had been knocked off the tree by the fall. They were actually live shells. I spent about three hours roaming through the forest. Great collecting — few individuals but fifteen species. This is what is expected in the tropics.

—**Noro Road:** We drove from Munda northwest for about a half hour before being left out in a clearcut farming area. We did find some snails on plants. Walking on the irregular limestone outcrops required careful footing. At the base of an eight-foot limestone cliff I checked the soil and found several kinds of dead shells. These included the operculates *Pupina keraudreni* and *Truncatella querinii*. The *Pupina* is rice-shaped and shiny. The *Truncatella* resembles a urocoptid with pronounced radial ribs. I found sixteen species in all.

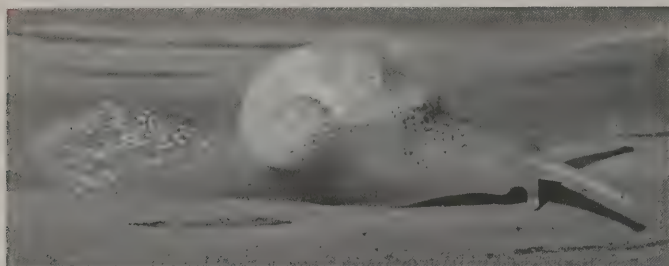
—**Holupuru Falls:** We returned to Holupuru Falls for another visit. We collected in a different area and saw only about a tenth of the snails we saw a few days ago. It had rained since then and we expected great collecting. We did get variety — ten species — but not quantity. The good news was, I didn't fall in the river this time.

—**Ghizo:** We took a short plane ride from Muna to Gizo. [Gizo is the city on the island of Ghizo.] Gizo is the second largest city in the Solomons, with 2,000 people. The largest city is the capital of Honiara on Guadalcanal. The Gizo airport is on Nusatope, a small island a few minutes' boat ride from the town. We stayed at the Gizo Hotel across from the airport pier.

The local market is active almost every day. The people arrive early to occupy the stalls lining the waterfront under the shade of the tall



Placostylus strangei climbing up a plant. New Georgia — Polo Viso Hills.



The animal of *Helicarion malaitaensis* is much too large to fit inside the shell. New Georgia — Holupuru Falls.

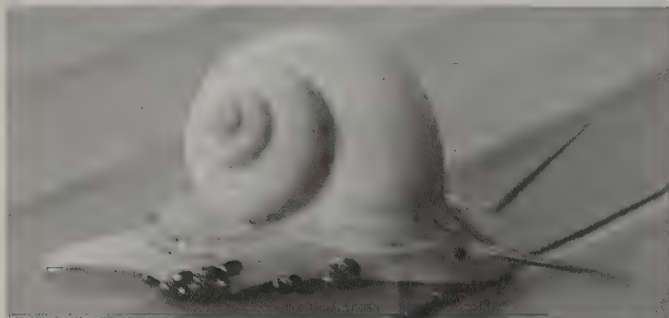
trees. They sell freshly grown produce including coconuts, bananas, cassava, sweet potatoes, taro, mangos, pineapples, betel-nuts, bush-limes, ngali nuts, peanuts and a range of baked cakes. At about five in the afternoon the fishermen add tuna and other fish to the selection. At Munda I frequently drank the bush-lime juice. At Gizo I was told that they added sugar to it. Not liking sweet lemonade, I emphasized that I wanted it unsweetened. When it came it was so sour I could hardly drink it. It felt like my teeth were curling up. I found it is prepared by adding eight teaspoons of sugar per liter; this makes it potable — not sweet, but potable. I did not order it unsweetened again.

—“Over the Top”: I went for a walk to the rainforest. At the spring beyond the power plant we walked upstream for a hundred yards and found some snails. Further up the “Over the Top” Road we passed the cemetery and then went to the north, into the bush, and down a canyon. Found seven species.

—Saeraghi Village: Six of us went for a half hour boat ride to the west end of Ghizo Island to visit Saeraghi Village. The village has a very pretty setting with a long, white, sandy beach and extensive protecting reefs. We looked at their shells for sale, all marine, but some people bought them anyway.

Each family has three houses, one for sleeping, one for eating, and one for cooking. The cooking house is set apart from the others so that, if it burns, the other two are safe. Many of the children at Saeraghi are blond. I guess the Vikings were once here.

At the forest edge of the village I found *Dendrotrochus cineraceus cleryi* on the low foliage.



Leptopoma perlucidum is a widespread operculate species. It is depositing eggs. New Georgia — Holupuru Falls.

—Noru and Olasana Islands: We went by boat to the small, flat island of Noru, just west of Kennedy Island, where the PT-109 incident took place. Noru had no landsnails. We took a short boat ride to Olasana Island where we had a barbeque. This island does have some trees, but is very low. I did find some *Omphalotropis nebulosa* and *Pythia*.

—Gizo Forest Park: We visited the Gizo Forest Park, an area planted in the mid-1960's by the Forestry Department to see how a wide variety of imported trees would fare in the Solomons. Some are now major plantation species. I had been to the spring and creek in my walk “Over the Top.” This time we went up the hill at the spring. Our guide told us there hadn't been a real rain in three months. I didn't find

much on the hill so I went back up the creek — did pretty well — eight species.

—Lembu Bay: The two Gilbertese guides arrived so we went on a boat ride to Lembu Bay on the north side of Ghizo. It was suggested I take a life preserver — you never know about canoes. We traveled a half hour before we got out, walked across the second growth forest on the peninsula and met the canoe on the other shore. We visited a man and his family who were chain-sawing a big rosewood tree. It had been felled a while because all the leaves were dead. I didn't see any *Placostylus* but did see *Neritodryas cornea* in the trees ten to fifteen feet above the ground. [See *American Conchologist* 25(4): 15, December 1997, “On *Neritodryas cornea* (L., 1758), In A Roundabout Way” by Emilio Garcia] When I touched them I found there was a drop or two of water between the shell and the leaf. Saw nine species today.



Placostylus strangei “adult” (with reflexed lip) growth series.

L-R, no lamella on columella, lamella on columella but no parietal tooth, lamella on columella and bud of parietal tooth, developing parietal tooth, and developed parietal tooth. New Georgia — Munda.

—Coast north of Maringe Hill and Ringgo Kuundu Island: The group was taken by boat to Ringgo Kuundu Island but I was dropped off on the coast. There was a lot of mangrove but I finally got through it to the second growth slope. At the top of the slope was a cleared coconut plantation. I found four species.

When I returned to the group on Ringgo Kuundu Island I found *Omphalotropis nebulosa* and *Truncatella querinii* in decomposed wood at the base of a tree.

—“Over the Top”: Walked along “Over the Top” Road and went a few hundred yards down Konggulavata Peninsula Road. I found two live *Dendrotrochus cineraceus* in a tree. I checked out some burned areas along the road and found many dead species, including *Ceratopoma spinifera*, *Chloritis eustoma*, *Setaepoma hoodi*, *Omphalotropis nebulosa*, *Pupina keraudreni* and *Truncatella querinii*. I went down Maringe Hill Road several hundred yards and found dead *Trochomorpha xiphias* and *T. zenobia*. There was a pleasant breeze and it was a delightful walk. It was my best collecting day on Ghizo with eleven species.

Observations and Queries

The first specific record of landsnails from Ghizo Island was by the Crocker Expedition in 1934. “The island of Gizo, off the north coast of New Georgia was explored and a few shells obtained.” [Clench 1941:2] In 1941 Clench described a new *Placostylus* species collected by A. Seale which Clench called *P. gizoensis*. This is the only *Placostylus* recorded from Ghizo.

The vegetation of Ghizo was temporarily modified by World War II but devastated by the extensive clearcutting in the mid 1960's. The entire island was clearcut in one fell swoop! There is no primary forest remaining. In my short reconnaissance of five wooded areas on the island, I found no evidence of *Placostylus* either in the trees or on the



Pupina keraudreni resembles rice seeds. Ghizo — Over the Top Road. 6.7 mm.

ground. *Placostylus gizoensis* may be extinct! Few, if any, of the larger arboreal species have survived.

The large-sized Orthalicidae genus *Placostylus* extends from the northern tip of New Zealand through Vanuatu and the New Hebrides to Bougainville. The largest Solomons species (found on Guadalcanal and San Cristobal islands) is *P. cleryi* which attains a shell length of 112 mm.

An observation on *Placostylus* — all specimens seen were on the ground or ascending trees or branches. None were descending. Question — do the snails spend the day in the treetops and descend to the ground at night to feed and then ascend the next morning? Or are the ascending snails ones that have come to the ground to mate or lay eggs? I did see young snails ascending the trees in the morning. Could this be their first ascent? They were too young to have come to the ground to deposit eggs.

In the second growth forest *Dendrotrochus* is the most abundant and widespread genus. The three species seen were *D. cineraceus cleryi*, *D. cyrena* and *D. meridionalis*.

Chloritis eustoma was found at all New Georgia mainland sites and at two wooded localities on Ghizo. All specimens seen were dead! It was the largest sized snail on Ghizo.

In Southeast Asia I was used to finding ground-dwelling operculates (Cyclophoridae). The ground-dwelling *Cyclotus* and *Cyclophorus* are found eastward to New Guinea but not in the Solomons. *Leptopoma perlucidum* was on low vegetation or on the ground. This species is found from Indonesia to the Solomons. Why is this operculate species so widespread when other species are so regional?

Eight identified species of Papuininae were found. The *Papuna* (now *Solmotella*) *fringilla* and *P. vexillaris* nomenclature of Pilsbry 1890 and 1891 has been used. This agrees with the descriptions and

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Spotlight on the Clubs:

The Astronaut Trail Shell Club has begun publication of a colorful newsletter for junior members, *The Snail*. October 1998 was Issue # 6. Information about a field trip to Harbor Branch Oceanographic Institution and a shell name puzzle were featured.

figures of the types. It is also used by Richardson, Abbott, Hinton, and Parkinson have the names reversed. Their *vexillaris* is *fringilla* and *fringilla* is *vexillaris*. The confusion in Parkinson was pointed out by Goldberg in 1989.

Pythia was everywhere.

The tropical tramps *Lamellaxis gracilis* and *Subulina octona* were found near settlements on both islands. Fortunately *Bradybaena similis* and *Achatina fulica* were not seen.

Truncatella querinii, the leaping snail, moves by extending the proboscis, the foot and shell are then pulled up, and the proboscis extended again. It moves like a measuring-worm. *Truncatella* was found at various localities: the Polo Viso Hills, Noro Road, Hopei Island and at Ghizo at "Over the Top" and Ringgo Kuundu Island. It was usually found with *Pupina keraudreni*. Maybe the scattered and odd locations have a common factor. It may be my collecting technique. In the forest areas I looked at the trees and ignored the ground. On the small flat coral islands I searched the soil. *Truncatella* and *Pupina* were found whenever there was enough duff to form a layer above the coral sand.

The biogeography of the Solomons is complex. It has elements of Australia-New Guinea (Papuinae and *Cerastopoma*), New Zealand (*Placostylus*), Pacific Islands (*Partula*), Southeast Asia-Australia (*Chloritis*), Southeast Asia (*Trochomorpha* and *Leptopoma*), Western Pacific (*Dendrotrochus*), and has its own endemic genera (*Crystallopsis* and *Setaepoma*).

What did I learn about tree snails? In general, tree-dwelling snails are brightly colored with smooth shells that are taller or at least the same height as width. This is in contrast to the ground-dwelling snails which have dull color patterns and are more frequently wider than tall.



Truncatella querinii is a tall operculate with strong radial ribbing. The best species fit is a New Hebrides species, but the Solomon specimens are taller. New Georgia — Noro Road. 10.4 mm.

This was my best shelling trip. There were many species and most were alive. I found twenty-nine identified species, excluding freshwater, plus some unidentified species. The families with the most species were Camaenidae with ten, Helixarionidae with four; and Assiminiidae, Helicinidae, Subulinidae, and Trochomorphidae with two each.

Dan Yoshimoto writes: "...there is a new budding shell club being started in Eureka, California. The Lost Coast Shell Club. Wish us luck." Good luck, all you shellers from The Lost Coast of Northern California.

SOME INTERESTING VENEZUELAN MOLLUSKS — IN THREE FEET OF WATER OR LESS!

By Emilio F. García

On a trip to Venezuela last June a group of us had the opportunity to collect from Paraguaná Peninsula to Margarita Island; that is, from almost one end to the other of the coastal area of that beautiful country. For most of the group, it was their first visit to Venezuela and they were eager to find their first *Cypraea mus* Linné, 1758, their first *Voluta musica* Linné, 1758. Not to worry, they were there aplenty. However, even though most of the collecting was done between the littoral zone and three feet of water, a number of other, very interesting species were found in that shallow water zone.

Three of the species stood out for their large sizes. One is a 35.9 mm *Lyropecten antillarum* (Récluz, 1853) I collected on one of the offshore islands. It was so large that I did not identify it until I got home. Mrs. Kathy Krattli, of O'Fallon, MO also found, on an adjacent island, inside fire coral, a beautiful 35 mm specimen of that species, marked with pinkish growth rings.



Fusinus caboblanquensis Weisbord, 1962: left to right: 162 mm (Stubblefield collection); 190 mm, 140 mm (Krattli collection). All photos by the author.

Once you get past the more civilized areas and the thousands of pieces of paper and plastic crucified by the wind onto the spines of the cacti that abound in Paraguaná Peninsula, there is a sort of ascetic beauty in its arid landscape. This area also has a very rich molluscan fauna. It was here that we hit the jackpot for *Fusinus caboblanquensis* Weisbord, 1962. And yes, folks, in three feet of water. It was not one of the best days to be in Paraguaná. It was cloudy and very windy, and this had made the sea wavy and murky. You would not see us rushing to the beach to be the first in the water that day! Instead, each of us tried to be the last, to see who had enough courage to get in. What was the point?! One could not see anything, anyway.

Well, I guess one could, if one were three feet away from the shell and the shell was BIG, like a 7-1/2 inch *Fusinus caboblanquensis*?

That is what Kathy Krattli found, not too long after she got in the water. We did find smaller ones that day and the next, as tiny as five inches; and what was interesting, besides their beauty, was the great variability of the species in an area no larger than 20 square meters. Although *F. caboblanquensis* has been synonymized with *F. closter* (Philippi, 1850), even the "smooth" specimens of the former will always have that differently colored area at the top of the shoulder that can vary from just an extra large cord to a very knobby keel (see picture). Besides, the periostracum in *F. caboblanquensis* is darker and thicker.



Chicoreus spectrum (Reeve, 1946): 50 mm juvenile.

I found the third extra large specimen while walking on an isolated sandy beach in northern Paraguaná. It was a 61 mm *Chione intapurpurea* (Conrad, 1949), just sitting there, in an otherwise denuded beach. While cleaning it at home, I found that one of the "grains of sand" stuck between lamellae turned out to be a little cystiscid (we used to call them marginellids). It pays to clean your shells with a magnifying visor. All three of the above specimens are larger than the published records for the species.

Sometimes those of us who have collected for many years tend to dismiss certain collecting localities. Like exposed rocky areas in the Caribbean. Why bother? I have everything that can be found there: same old limpets, same old common columbellids and same old eroded tegulas. Who wants them? And sometimes our newer colleagues remind us not to take things for granted. Here's what happened at this one beach near Puerto La Cruz.

When we arrived at the beach I had gone straight into the water, but found nothing in spite of my ambitious attempts at hand dredging. Then I joined my neophyte friends at the rocky beach, since they seemed to be having fun. When I started lifting rocks it seemed so "dejá vu" all over again: zillions of *Tegula excavata* (Lamarck, 1822), *T. hotessieri* (Orbigny, 1842), *Trachipollia nodulosa* (C.B. Adams, 1845)... Well, not quite. Some of the *T. nodulosa* turned out to be



Risomurex gilbertharrisi (Weisbord, 1962): Left: 17.5 mm; right: 19.2 mm.

Muricopsis gilbertharrisi (Weisbord, 1962), a few of the specimens with spectacular pink and black coloration; and some specimens that looked at first glance like young *Tegula* (particularly when one was not wearing the glasses one needs to wear if one really wants to see), turned out to be an interesting little species which I identified as *Calliostoma depictum* Dall, 1927. This species is not very rare...if you are in Brazil. But in Venezuela, that is another matter.



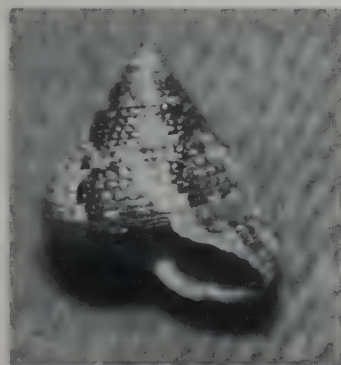
Lyropecten antillarum (Rélu, 1853): 35.9 mm.

When I got home I thought I had better get a second opinion on my ID on the *Calliostoma* because it was a significant range extension, so I sent a specimen to Dr. Harry Lee, of Jacksonville, Florida, for confirmation. Harry agreed that it was very close to *C. depictum* but, compared to

his *C. depictum* from Brazil, there were some differences. In his own words, "They are similar enough to be clinically conspecific or allopatric subspecies...I would call it *Calliostoma* cf. *depictum* Dall, 1927." So I am calling it that.

Hand dredging is a method that opens a new, exciting world for shell collectors. Terebras, marginellas, olives, nassarius, turrids and, yes, even muricids can be obtained this way. It was by this method that we found in the muddy sand of some of the offshore islands such interesting species as *Terebra angelli* (J. & W. Gibson-Smith, 1984), *Persicula obesa* (Redfield, 1846), *Panamurex velero* (E.H. Vokes, 1970) and the rare little muricid, *Pygmaeptyrys juanita* (J. & W. Gibson-Smith, 1983) (one). As we moved with our hand dredges in two to three feet of water we looked like a band of flamingoes feeding. I wonder if that is what the tourists on the boat that passed by were saying as they pointed at us.

Our easternmost destination was Margarita Island. I had been there a number of years earlier and was astonished (and sick), to see how much it had grown and how much of its charm had been lost. The collecting was as expected, except for an unusually dark specimen of *Epitonium unifasciatum* (Sowerby, 1844) found by Vern Stubblefield in grunge near Juan Griego, northern Margarita. Grunge fascinates me.

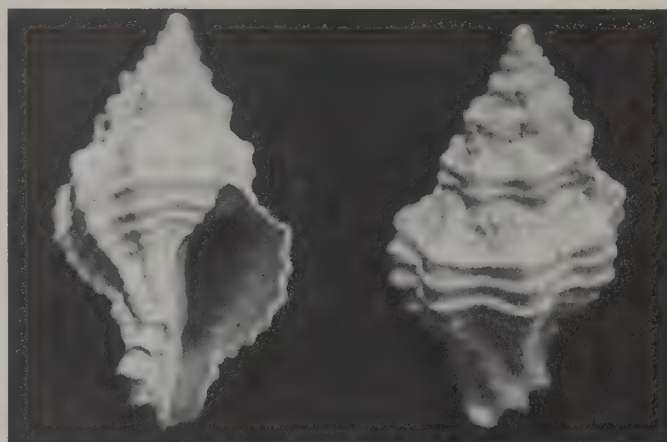


Calliostoma cf. *depictum* Dal, 1927: 9 mm.



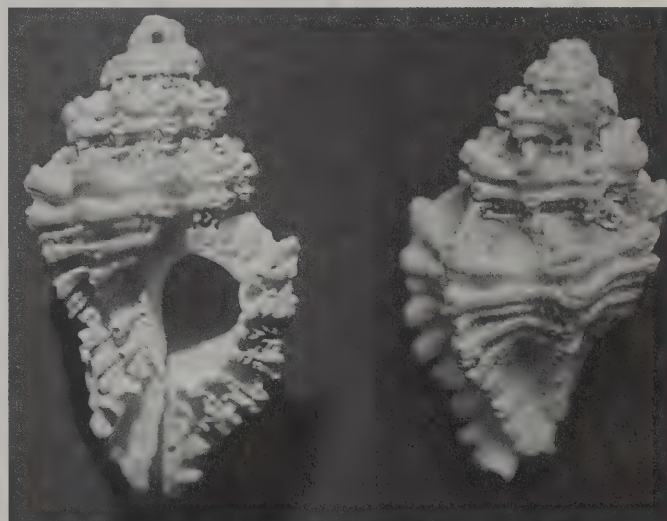
Epitonium unifasciatum (Sowerby II, 1844): 13 mm.

When I got home I thought I had better get a second opinion on my ID on the *Calliostoma* because it was a significant range extension, so I sent a specimen to Dr. Harry Lee, of Jacksonville, Florida, for confirmation. Harry agreed that it was very close to *C. depictum* but, compared to



Panamurex velero (E.H. Vokes, 1970): 17.5 mm.

There are so many jewels to be found in it if one just has a little magnification. So, when I got to that area, I went straight to the grunge. It was nice, but nothing to write home about because the wind had not been blowing hard enough lately and the stuff was rather old. We were ready to go and I was just standing there, waiting, when Vern came to show me something. I looked at whatever it was (I forget), and then Vern bent down, right in front of me, and picked up the beautiful Epi. Many of you know exactly how it feels.



Pygmaeptyrys juanita (J. & W. Gibson-Smith, 1983): 17.3 mm.

During one of our stops in Margarita we entered a stall where they had some Venezuelan shells for sale at very high prices, and two large specimens of *Chicoreus spectrum* (Reeve, 1846). I was puzzled at finding such a species there, but the owner told me they came from the area. "Su-u-u-re," I said to myself. However, now I am "SURE." Bill Clendenin, of Sarasota, Florida, found it in one of those heaps of muricids in Margarita about which you read in Dr. Emily Vokes' article in the last issue of *American Conchologist*. It is a young specimen (50 mm), and has the siphonal canal broken; otherwise, it would have the typical long canal of the species. It also has that very typical rusty-orange color of many *spectrum*, which happened to be the same color as the two large, very obvious specimens of *C. spectrum* I saw at the shop.

So, you see, gang, those of us who don't quite feel like jumping off a boat in 100 feet of water in the middle of the night may never find a live *Conus adamsonii* Broderip, 1836 but, if we persist, we will find species that are just as exciting for the right person. In three feet of water or less.

The Living Pleurotomariidae, A synopsis of the Recent Pleurotomariidae including colour plates of all extant type specimens. By Patrick Anseeuw and Yoshihiro Goto Edited with plates and additional contributions by Paul Callomon. Elle Scientific Publications, Osaka. January, 1996. 202pp. quarter-leather bound, slip-cased. 8-1/2" x 11". About \$200.

Since their first discovery at the dawn of the era of deep sea exploration, slit shells have commanded the interest of malacologists and the esteem of collectors. Because of their inaccessible habitat, these living fossils were rarely collected and are poorly represented even in the largest museum collections. For a century after their discovery, every new collection of specimens generated a series of publications. Although the literature on pleurotomariids is extensive, it consists primarily of short papers treating aspects of the morphology or behavior of one or relatively few species. Comprehensive revisions were published by Sowerby in Reeve (1874), Tryon (1890), Schmalz (1901-1907) and most recently by Bayer (1965), who illustrated all twelve species known at the time. The increasing use of research submarines, tangle nets and deep-water trawling has since doubled the number of known species.

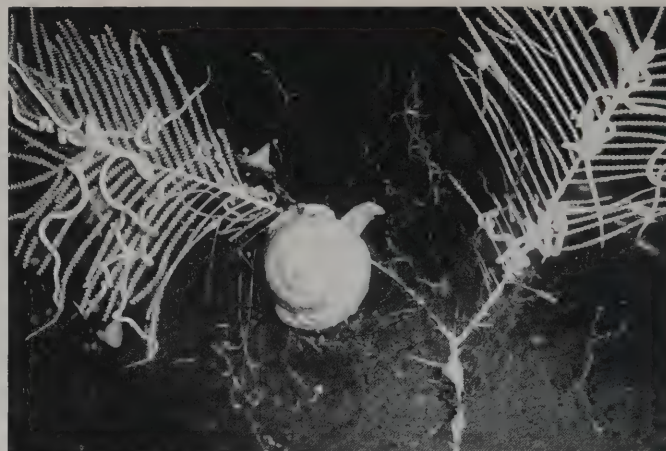
The Living Pleurotomariidae describes and lavishly illustrates all of the twenty-four species and two subspecies now recognized. Following a Foreword, Acknowledgments and Editor's Notes are sections on The Recent Pleurotomariidae (an overview of the history of their discovery), Zoogeographical Distribution, Habitat and Ecology, Colour and Shell Structure, and Taxonomy. Next comes a section defining and illustrating the terminology used in the book, followed by four pages of silhouettes of all species shown at their actual average size. These are a preamble to the main portion of the book, containing Descriptions of Species and Plates, in which all living species and subspecies are treated alphabetically within the two recognized genera, *Entemnotrochus* and *Perotrochus*.

For each species, the authors provide an abbreviated synonymy, citation for the original description, dimensions of the holotype, the type locality, the repository for the holotype, a diagnosis subdivided into various aspects of shell morphology, a section identifying the material examined, depth range and notes. This section is followed by color illustrations. The first plate shows the holotype in four standard views (basal, apical, apertural and right lateral). Subsequent plates illustrate the range of variation in shell morphology, including photographs of juvenile specimens and holotypes of synonymized taxa.

Three appendices are included. The first treats two taxa of uncertain status, including illustrations of their holotypes, the second provides notes on and illustrations of pleurotomariid radulae, the third deals with the geographical and bathymetric ranges for each of the species. The book concludes with a "Literature Cited," followed by an "Additional References" section. Interspersed throughout the book are illustrations of living pleurotomariids, either in their natural habitat or in aquaria, reproductions of color illustrations from classic works, postage stamps featuring pleurotomariids, as well as photographs of other invertebrates and fish that live in the same habitats as pleurotomariids.

Patrick Anseeuw and Yoshihiro Goto each have devoted decades to studying the Pleurotomariidae, and in the process amassed collections unrivaled by any in the world. Paul Callomon contributed his considerable talents, most notably as editor and photographer. In producing this book, they have conducted field work, consulted numerous researchers and collectors and examined many major collections both private and institutional. The result is the most comprehensive treatment of the living members of the family ever to be published.

The Living Pleurotomariidae is a thorough, well-organized and magnificently illustrated compilation of what is presently known about all living members of this family. The authors incorporate a conservative classification, and discuss in detail their reasons for synonymizing



In a photo taken off Ilets-a-Goyaves, Guadeloupe, Lesser Antilles from a Johnson-Sea-Link submersible in 306 m an acrobatic *Perotrochus pyramus* F.M. Bayer, 1967 is doing a workout on the uneven bars of a sea fan. One of the three little conical shells is the holotype of *Calliostoma cnidophilum* Quinn, 1992, the others are paratypes. Photo by Jerry Harasewych.

such taxa as *Mikadotrochus* (p. 18) or *Perotrochus notialis* (p. 61). When species are synonymized, the holotypes of senior and junior synonyms are illustrated, usually together with intermediate forms. This book is extremely useful to all who have an interest in Pleurotomariidae. Intended primarily as an identification guide, it fulfills this role superbly. To researchers, its greatest value lies in the excellent photographs of the holotypes of all species, including those of synonymized taxa, that far surpass the illustrations accompanying the original descriptions of these taxa. To the general collector, naturalist or novice, it provides a well rounded introduction to the biology, ecology and diversity of this important group of animals.

Because many researchers, myself among them, were consulted during the preparation of this book and their suggestions incorporated, it is difficult to find faults. Perhaps more could have been made of the extensive fossil record extending back to the Paleozoic, with about 1500 described species, but then, this is a book about living Pleurotomariidae. Even so, references are provided that will serve as an introduction to the fossil literature.

Especially noteworthy is the fact that, apart from type material, all of the specimens illustrated in *The Living Pleurotomariidae* were originally part of the Goto Collection. Mr. Goto presented this entire collection to the National Museum of Natural History, Smithsonian Institution, just prior to publication so that it may serve as a resource for future work on pleurotomariids. I am sure that the research community appreciates this generous gesture, and would encourage other authors to consider archiving their important, figured specimens in museums so that they are accessible to future generations.

Within seconds of opening *The Living Pleurotomariidae*, even the novice becomes aware that this is no ordinary shell book. The elegant and understated slipcase, the quarter-leather binding, the quality of the paper, the luminous color illustrations, all proclaim that no effort or expense was spared, no detail overlooked to make this book simply superlative. In searching for comparisons, the great iconographies of the 18th (Thomas Martyn's *Universal Conchologist*) and 19th (Jean Charles Chenu's *Illustrations Conchyliologiques*) centuries come to mind. *The Living Pleurotomariidae* maintains that tradition in the 20th century.

The Living Pleurotomariidae is an important book for museums, libraries and collectors with a serious interest in pleurotomariids, and also for bibliophiles. The price is high (US \$200), but well within the range of what shell books cost these days. Certainly, corners could have been cut to reduce the cost of this book. I, for one, am grateful that they were not. This is not a book that every collector will own. Those who don't should at least make an effort to see a copy. You will find yourself whispering, "WOW!"

—Jerry Harasewych

BOOK REVIEWS:

Fauna Malesiana. Guide to the Landsnails of Bali

J.J. Vermeulen and A.J. Whitten. 1998. Published by Backhuys Publishers, Leiden, the Netherlands. 164 p., 172 x 246 mm, b/w drawings, hard cover, ISBN 90 73348 84 6. About \$45.00

I don't specialise in landsnails. I simply don't enjoy tramping through rainforest, being eaten by leeches and mosquitoes, for a few miserable brown snails that look so cute you'd feel sorry to kill them. However, when I saw this book for the first time, I wished I was interested in landsnails, for this new book is simply delightful.

It is not very big, but then, neither is Bali. Yet it covers more than 100 species of shells, from minute snails to those over 40mm. There is also a section covering 21 species of those elusive Ellobiidae from the mangrove swamps of much of the Indo-Pacific. It's wonderful to finally see them described somewhere.

It contains some revealing introductory sections. Few people would realise, for example, that sections of Bali are seasonally arid. There is also some advice on how to study landsnails, how to collect them and how to curate a collection.

The identification of the snails is as accurate as possible. The authors have made efforts to identify their shells as correctly as can be done, and have enlisted the help of many well-known malacologists. However, *Fauna Malesiana: Guide to Landsnails of Bali* is not intended as a taxonomic publication, and it merely summarises the current knowledge on the landsnails of Bali. The authors admit that the land-snail fauna of Bali is poorly studied, and that further research will most likely uncover additional species.

Each species is described and figured from at least one side. The descriptions focus on recognition features, and include distribution outside Bali and information on habitat if known.

The book is a very nice production. Its design is simple, and the soft black and white illustrations by Tony Whitten are simply excellent. It is a beautiful hard cover book printed on satin soft paper. It looks good, and feels good and for me, is the proof that you don't need colour pictures to produce a nice shell book. I would recommend *Fauna Malesiana* to anyone even remotely interested in landsnails.

—Patty Jansen

Our hardworking, hard reading reviewer, Patty Jansen, is a native of Belgium, who lives in New South Wales, and who runs a shell book business, Capricornica. You'll find her ad elsewhere in this issue.

Marine Shells of South Africa, by Douw G. Steyn and Markus Lussi. 1998. Published by: Ekogilde Publishers, P.O. Box 178, Hartebeespoort 264 p., 214 x 304 mm, full colour, hard cover, ISBN 0 9583889 5 4

We have spent years complaining that there really isn't a very good book on the shells of South Africa, now that *Seashells of Southern Africa* by Kilburn and Rippey is no longer available and a reprint not likely. And now, out of the blue comes this beauty!

I couldn't wait for this book to arrive in the mail. And then when I opened the box... wow! What a beautiful book to look at! The inside is equally beautiful and well-designed, with a page-filling photograph of shells on one side. The shells are set on a black background, and not just their numbers, but also their names are underneath each shell. The text is arranged opposite the plates, and includes a distribution map for each species. The text includes comments on habitat and abundance. The entire book gives a very easy and un-cluttered appearance.

There are more than 1000 species covered, only about one fifth of the total South African molluscan fauna, but including most of the larger shallow water species from the region. Coverage ranges from chitons to bivalves, and includes some shelled opisthobranchs and cephalopods, and a selection of pelagic molluscs.

I do not have any serious criticism, but would like to make a few points about ways the book could have been even better.

I think it is a pity that most of the shells are slightly tilted in the photographs. I must admit, having done it many times myself, that photographing a shell dead-straight is not easy, but sure electronic technology these days makes it easy to correct this human weakness.

Also, I think that to mention ranges outside South Africa would have made the book even more valuable. There are many endemic species in South Africa; it would have been nice to know which ones they are.

I admire the fact that the authors have chosen to use beach shells in many occasions. This is, in fact, the condition in which we are most likely to find them. I use beach shells myself, because I personally no longer believe in collecting live shells. But the trick with using beach shells in photographs is to choose your shells well. I am sure it would not have been too difficult to find a better specimen of *Hastula diversa*, since it's common.

In all, I think this is an excellent book that will prove very popular with shell collectors. I just hope the publisher has printed enough copies, or that they are prepared to reprint if they haven't!

—Patty Jansen



What Am I Going To Give Dad for Christmas?

by Patty Jansen

Tip: The best way to deal with this article is to photocopy it and anonymously mail it to someone who has you on their gift list.

OK, let's face the scenario. The Holidays are fast approaching, and you've got to buy someone a present, someone who collects shells, who's a close relative, or maybe a very good friend. A very daunting job indeed. You could give a shell but, well, he's got so many shells already.

Then how about a book? A shell book! There are so many good books around these days, almost all in colour and most in hardcover editions. (Many of the specialised publishers are collectors themselves, and they know how badly collectors treat their books!) But which book?

If I were a beginner, I would most likely need a copy of the brand new reprinted *Compendium of Seashells* by (the late) R. Tucker Abbott and S. Peter Dance (1998), or maybe I would like it as a replacement for my old copy that has fallen apart? *The Compendium*, as it is known affectionately, is simply a classic, adorning the library of almost every collector I know, the first serious book most of us received. With its worldwide coverage of over 4000 species of both gastropod and bivalve families it is ensured a top spot on collectors' "must have" book lists for some time to come.

If I collected cones I would definitely like a copy of *Manual of the Living Conidae* by Röckel, Korn and Kohn (1995). A very big book, it describes all the cone species from the Indo-Pacific. There are photographs of living animals and radulas, and many forms and sub-species are also covered. I don't collect cones, but cone collectors I know never stop raving about this book. Be warned: it is expensive.

If I were a cowrie enthusiast I would need a copy of *Guide to*

Worldwide Cowries by Lorenz and Hubert (1992). The latest, most definitive work on the cowries, it includes all, or at least most, species of cowries in the world, including subspecies and forms. The 112 colour plates are out of this world. Got that book already? Bummer! But there are others. My all-time favourite shell book is probably *Cowries and Their Relatives from Southern Africa* by Bill Liltved (1989). It describes in depth all South African cowries, ovulids and triviids in a manner that is seldom seen in modern shell books, and also includes sections on the living animal and its natural history. All species are photographed from at least two sides, and for many species there is a photograph of the living animal. All photographs are in colour and are of an unsurpassed quality, especially the living animal shots. It is not easy to get, but if you look around, you will be able to find a copy.

Murex lovers are a bit left in the cold, although there is a book called *Illustrated Catalogue of the Muricidae Described Since 1971* by Roland Houart (1994). I believe the same author is working on a more comprehensive Muricidae book, but that is still a long way off.

If I collected volutes, I know I would want a copy of *Volutes* by Guido Poppe and Yoshihiro Goto (1992), certainly the most recent treatment of the family worldwide. The colour plates in this book are excellent.

On the subject of pectens, there is *Guidebook to Pecten Shells of the World*, by the late Tony Rombouts (1993). It is quite useful, with colour plates of good quality, although I think the quality and consistency of the text leaves a bit to be desired. Just to be clear: I am NOT talking about the taxonomy here. But — let's face it — it's not even half as expensive as most of the books mentioned above either.

A plethora of books on assorted other families, and other groups are available. There is *Recent Cassidae* by Kurt Kreipl (1997), a nice publication by a collector; *Bursidae of the World* by Tiziano Cossignani (1994), with a nice layout; *Living Pleurotomariidae* by Patrick Anseeuw and Yoshihiro Goto (1996) — expensive, but hey, seeing is believing.

I don't know much about landsnails, but I really like *Fauna Malesiana: Land Snails of Bali* by T. Whitten and J.J. Vermeulen (1998). This book proves that you don't always need colour photographs to identify shells. Tony's drawings are delightful and very representative of the species. It also includes the often ignored Ellobiidae.

Then there are the regional guides. The most recently published of them is *Marine Shells of South Africa* by Douw Steyn and Markus Lussi (1998). It is a beautiful book and a must for anyone interested in this region, even though some of the pictured shells are beach-collected.

I am interested in Australian shells, so I usually recommend that people who ask me what books to buy for this region get these: *Australian Marine Shells* (2 vols.) by Barry Wilson (1993 and 1994), and *Bivalves of Australia Vol. 1* by Kevin Lamprell and Thora Whitehead (1993) and Vol. 2 by Kevin Lamprell and John Healy (1998). Since Wilson's *Australian Marine Shells* covers only prosobranch gastropods, the two complement each other nicely. Now let's wait until somebody writes a book about the remaining Australian gastropods (Hey, don't all look at me!).

I am also into microshells, and there is next to nothing on Australian microshells. However, I would like to mention the series, *Atlas of Mediterranean Seashells* by Riccardo Gianuzzi-Savelli, Francesco Pusateri, Alberto Palmeri and Claudio Ebreo. There are two volumes out already, and a third one is due soon. They contain many colour plates of shells from the Mediterranean, with amazing colour photographs of the smallest shells. There is very little text, just a name and distribution (in Italian). The books proved so popular that Vol. 1 quickly went out of print, and has been reprinted since.

Where do I get these books?

Shell books generally cannot be bought in a bookstore. You may find some of the above titles listed in Amazon.com on the Internet, but I will bet you that they don't have any stock. Since of the above mentioned titles only one was published in the US, it may take a while, in fact ages, for them to supply you with the title you want. You are much better off dealing with a specialised shell book dealer. Most shell collectors have their name listed with a couple of book suppliers, because each dealer has his different focus, and lists different titles. Also, it gives you the opportunity to take advantage of differences in currency values, as they occur over time. In *American Conchologist* and other shell publications, you will find advertisements from such book dealers. Otherwise, it may be a good question to ask at your next shell club meeting.

Shellers Tour the Smithsonian

by Rich Goldberg and Shireen Gonzaga

On Saturday, September 19, 1998, a group of enthusiastic conchologists had an opportunity to visit and tour the Department of Invertebrate Zoology at the Smithsonian Institution National Museum of Natural History (NMNH) in Washington, D.C. The tour was arranged by Rae Germon, the department's Collection Manager, after Shireen Gonzaga made an inquiry about setting up a behind-the-scenes tour at the museum.

Rae gave a very informal yet informative introduction to the department and collection. The department is steeped in malacological history; the likes of William Healy Dall and William Stimpson once walked the rows upon rows of collection cabinets in pursuit of their malacological research. The tour began with an introduction and history of the department, and an overview of the museum's molluscan collection numbering over 28 million shells. (The museum's collection is so large that the non-marine collection is housed at another facility outside Washington D.C., in a Maryland suburb.) Raye also gave the group an in-depth look at how the museum is using high-tech tools to monitor the atmosphere of the collection space, in an effort to battle Byne's Disease which has afflicted some of the collection.

Raye then proceeded to show us some specimens that are a collector's wildest dream! Among the many impressive shells we saw were

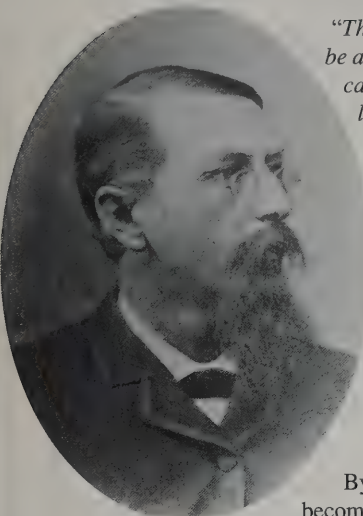
(Continued on page 26)



Participants in the Smithsonian tour: Front row from left: Sue Hobbs, Shireen Gonzaga, Henry Spafford, Virginia Arter, Evangeline Spafford, Raye Germon. Middle row: Eliza Dietz, Linda Grace, Lucy Muehleisen, Aydin Orstan, Jerry Crould, Rich Goldberg. Back row: Tom Grace, Bill Fenzan, George Muehleisen, Phil Dietz, Barry Norbeck. Pat Arter was also in attendance. Photo by Laura Kahler and S. Gonzaga.

William Healey Dall 1845-1927

by Linda Brunner



"The only lesson which may be said to be absolutely clear is, that the sacred fire cannot be extinguished by poverty nor lighted from a college taper. That the men whose work is now classical, and whose devotion it is our privilege to honor, owed less to education in any sense than they did to self-denial, steadfastness, energy, a passion for seeking out the truth, and an innate love of nature. These are the qualities which enabled them to gather fruit of the tree of knowledge."

—W. H. Dall, 1888

William Healey Dall

By such means did William H. Dall become a man revered by conchologists worldwide. Dall was born in Boston, Massachusetts, on August 21, 1845, to the union of a minister father and an energetic, intelligent, radical reformer mother. He ended his formal education at 17. It is believed that his religious father probably inspired him in his intellectual pursuits and that his discipline and drive were inherited from his highly intelligent mother. He left school because of a lack of interest in formal higher education as well as a lack of funds. While still in school, however, Dall did study Zoology under Louis Agassiz and mollusks under A. A. Gould. The latter is believed to have inspired his dedication to malacology.

Dall worked for the Illinois Central Railroad and then as a naturalist on the Scientific Corps of the Western Union International Telegraph Expedition to Explore Alaska in order to find an overland telegraph route from Alaska to Europe. This was an opportunity to explore unknown land. He cataloged its ethnology, geology, and natural history. Dall had an agreement with the Smithsonian, and returned to that institution thousands of specimens of mollusks and other animals taken on the expedition.

Following a job with the Coast and Geodetic Survey where he was in charge of steamers charting the Alaskan coast, Dall became a resident of the Smithsonian, not as its employee, but as an employee of the U. S. Geological Survey. Dall was at the Smithsonian for 47 years, first in a workshop in "the tower" of the old building, and later in more sumptuous quarters in the new National Museum built for him during Theodore Roosevelt's administration.

The 82 years of W.H. Dall's life overlapped what is known as "The Descriptive Age of Malacology." Three important facts stand out concerning Dall's contributions to malacology:

1) Dall described more molluscan species than anyone but Pilsbry. Of the 5,427 species and genera of mollusks, worms, crustaceans, brachiopods, tunicates and mammals, 5,302 of these are mollusks. Of the approximately 2,000 species and subspecies known in 1921 from Alaska to Southern California, 47 percent were described by Dall. His efforts, however, were not limited to the western U. S. He also did work in the southeast U. S., both recent and fossil, in Peru and on dredged material, most notably that from the "Blake."

2) Dall shared. Often when others visited him or expressed an inter-

est in the wealth of dredged material he had, he gave generously of that material and did not claim credit for their work on his gifts.

3) Dall resurrected Röding.¹ At one time there existed in Europe a disagreement over which system of nomenclature to follow, Linné's or Lamarck's. The disagreement was tied to the geopolitics of the time: England against Napoleonic France. The hostility spawned by this conflict (and in the previous centuries of contest for global dominance) persisted well into the 1830's in the zoologic as well as many other arenas. This dichotomy ultimately pitted the English (Linneans) against everyone else (Lamarckians).

The zoological controversy had its beginnings in the collection of J. F. Bolten who, upon his death in 1796, left a carefully compiled catalogue of his collection using a taxonomic system of his own. Two years later, P.F. Röding published Bolten's Catalogue, containing many new genera and species names. To make Bolten's names intelligible, Röding added synonyms and references to published figures, fulfilling the requirements of the modern rules of zoological nomenclature, and making Bolten's Catalogue a source of new names.

Some of Bolten's names were identical to those of Lamarck. The scientific community of the time, which had already accepted Lamarck's names, ignored Röding's, even though The Bolten Catalogue had been published BEFORE Lamarck. Thus many of the Lamarckian genera would be usurped and many then-familiar Lamarckian names would be suppressed as synonyms.

The Bolten Catalogue was so rare that it remained relatively unknown for over a hundred years, and nothing was resolved. But, during the first decade of the 20th century Dall began to resurrect the Röding names based on Bolten. This angered many of his contemporaries because it meant that several well known Lamarckian names would have to be suppressed. But Dall, imbued with some of that "sacred fire" he believed in, persisted, and Röding's names are now generally accepted. (Dance, p. 118-119)

When reading Dall's works one is impressed by their clarity and thoroughness. He is as easily understood by layman as by scientist.

Dall was not without creativity and a sense of humor as exemplified in the following wedding congratulation sent to Ida Shepard Oldroyd and Tom Shaw Oldroyd.

"Speaking from experience I may compare married folks to two valves of a clam, different, yet, in a sense, equal; necessary to each other for completeness; liable to nip anybody who comes between them; showing to the outside world whatever strength and beauty they possess, yet sheltering from observation all that is most precious, tender and necessary to life, between them. Quiet contentment is proverbial of clams and not to be despised by human beings; they are also said to be happy at high water, which I hope will never fail you. They enclose and foster the 'pearl of great price,' referred to in scripture and emblematic of all that is lovely in the marriage relations. Let us not forget their example. May care and sorrow follow you at a snail's pace and never catch up with you. May good fortune stick to you like an abalone to a rock, and your friends be as numerous as Littorinas."

It is appropriate that the exquisite *Cirsotrema dalli* is named in his honor.

William Healey Dall died in Washington, D. C. in 1927. His collections can be found in the U. S. National Museum and the Harvard Museum.

¹ Author's note: When asked if he knew why Dall resurrected Röding, Dr. R. Tucker Abbott said, "I don't know but, knowing Dall, he probably did it just to be obstinate."

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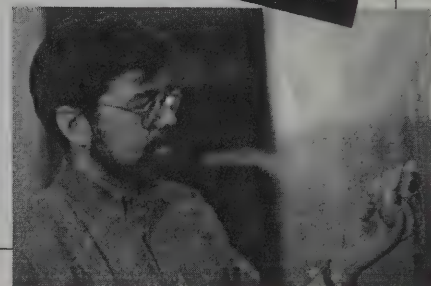
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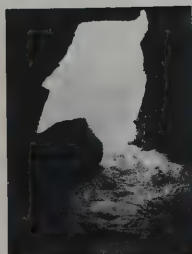
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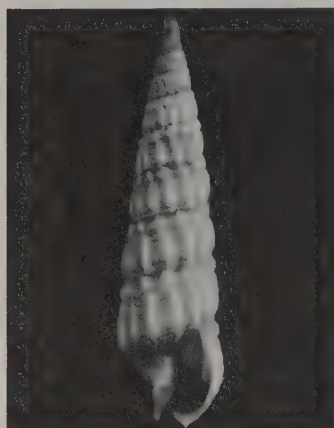
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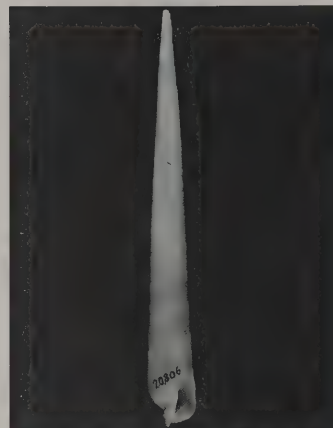
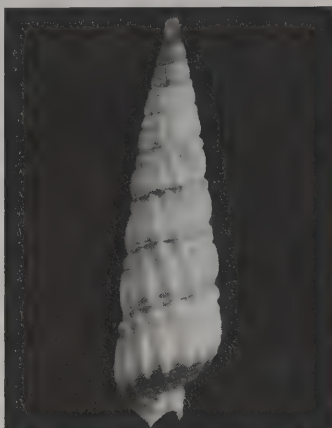
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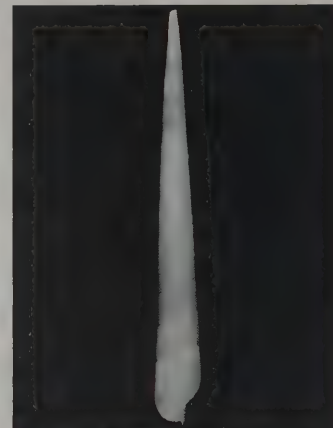
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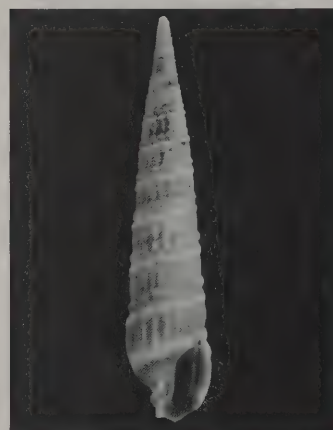
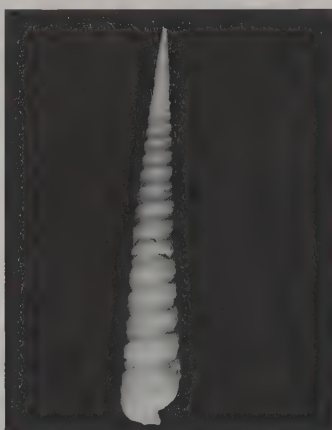
Terebra angelli (J. & W. Gibson-Smith, 1984). 15 mm. 5-10' in sand, off Isla Margarita, Venezuela.



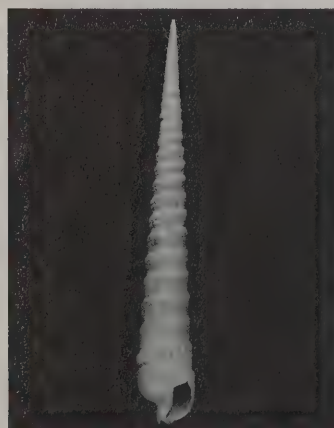
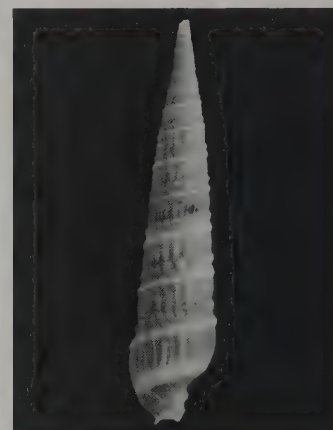
Terebra evelynae Clench & Aguayo, 1939. 94 mm. Atlantis station #3476, off Santa Clara Province, Cuba. Ex. Jaime Collection. PARATYPE



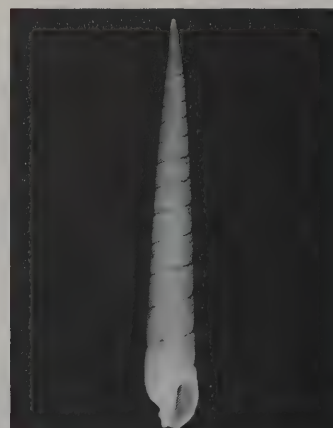
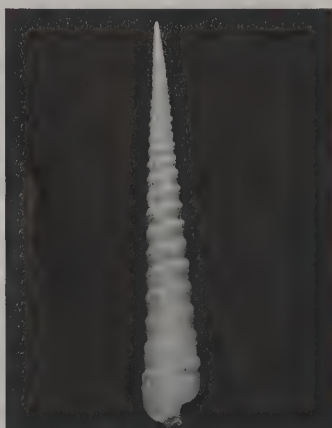
Terebra floridana Dall, 1889. 78 mm. 200' by dredge off Brevard County, FL.



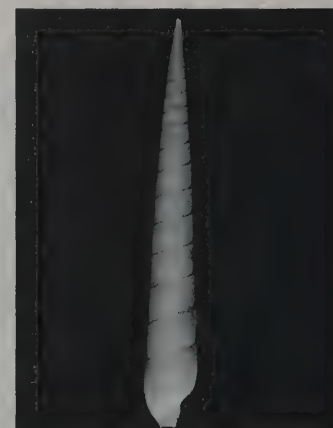
Terebra gemmulata Kiener, 1839. 38mm. 50 meters off Southeastern Brazil.



Terebra lindae Petuch, 1987. 77 mm. 600', dredged by Jim Moore off Egmont Key, FL. PARATYPE



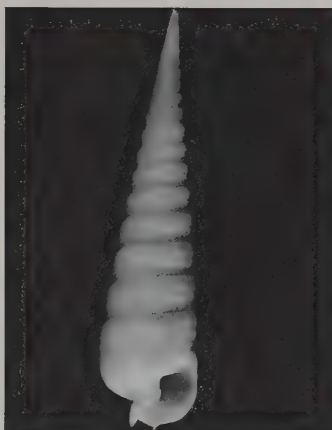
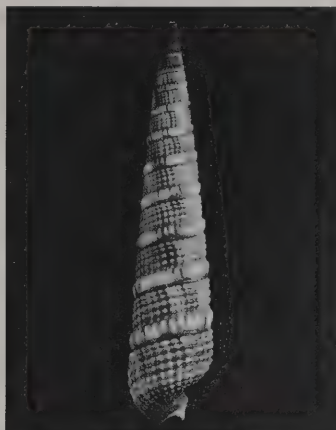
Terebra nassula Dall, 1889. 68 mm. 170 fms, dredged off Yucatan Channel.



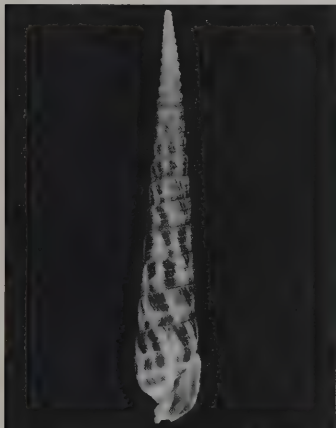
The intent of this feature is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



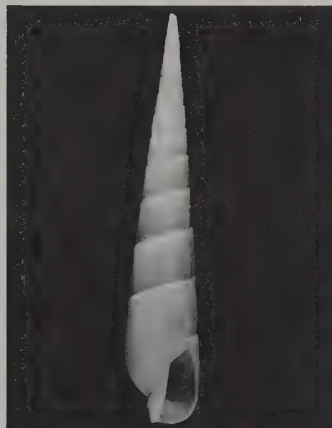
Terebra petiveriana Deshayes, 1857. 56 mm. 20' in sand, Santa Marta, Colombia.



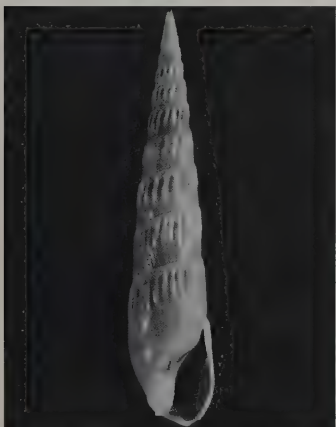
Terebra stegeri Abbott, 1954. 62 mm. 400', dredged off Contoy Light, Mexico.



Terebra taurina (Lightfoot, 1786). 85 mm. 3' in sand, Lake Worth near Peanut Is., Palm Beach, FL. Ex. McGinty Collection.



Terebra species. 80 mm. 500 meters, dredged off Cabo Caroché, Yucatan, Mexico. Ex. Ed and Kathy Sarkin Collection.



Hastula cinerea (Born, 1778). 38 mm. 2' in sand, New Smyrna Beach, FL.



Hastula salleana (Deshayes, 1859). 19 mm. Shallow water near Vera Cruz, Mexico.



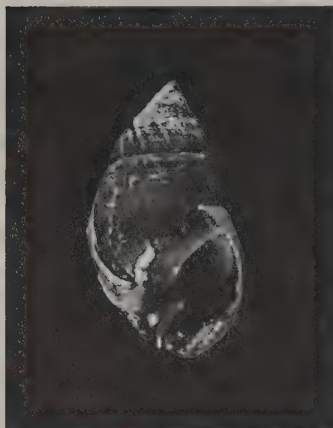
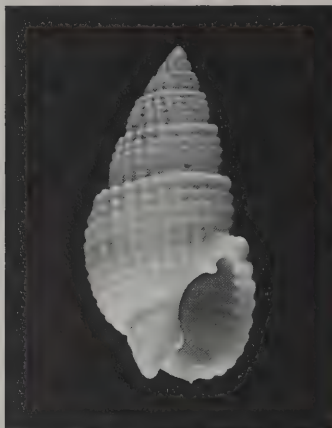
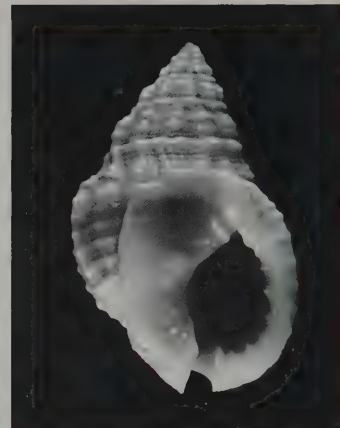
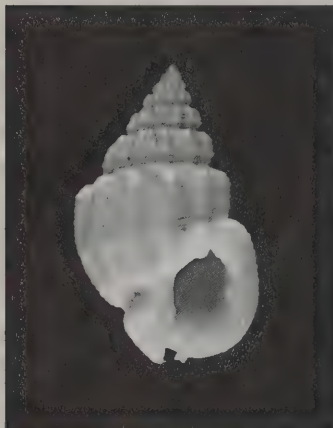
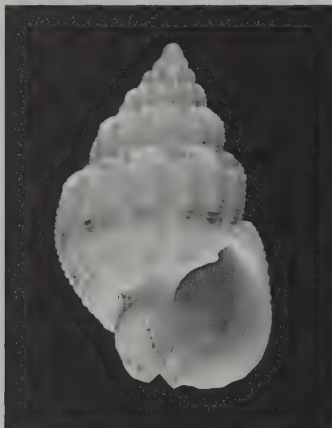
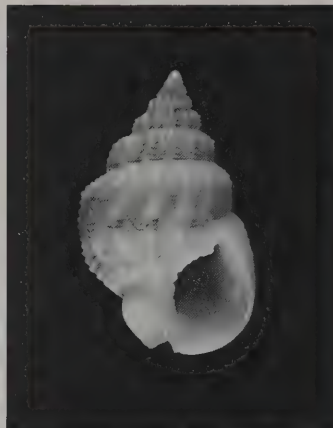
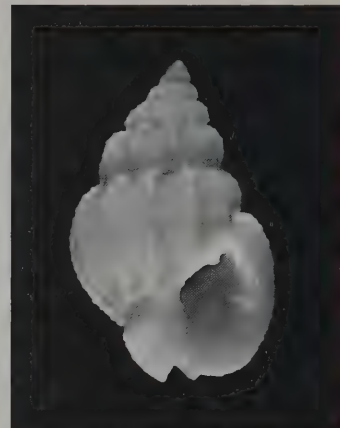
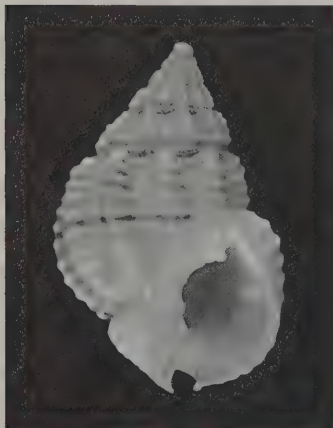
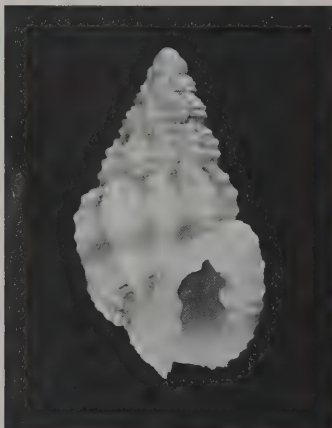
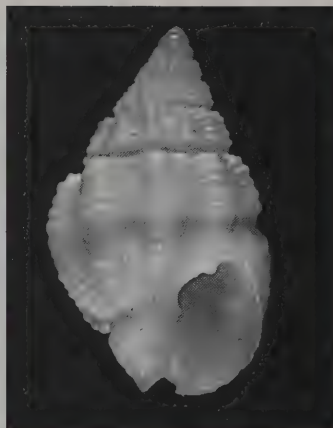
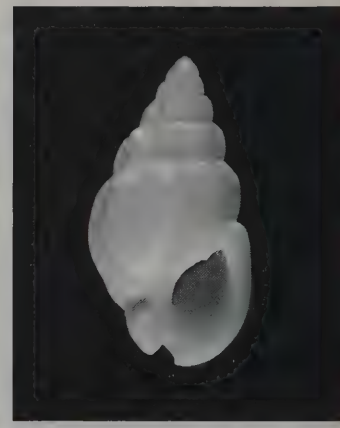
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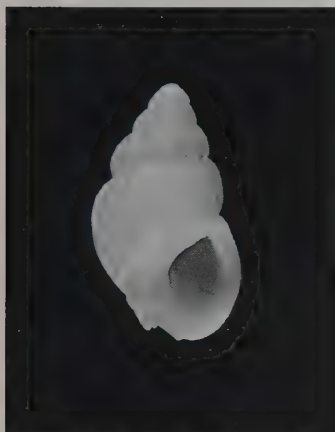
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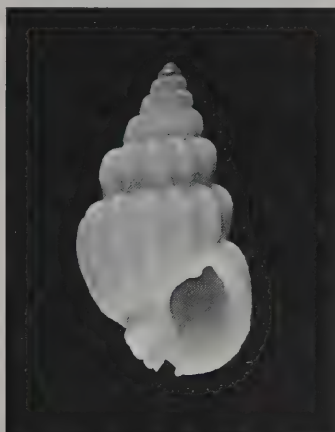
by Harry G. Lee

*Ilyanassa obsoleta* (Say, 1822).*Ilyanassa trivitatta* (Say, 1822).*Nassarius vibex* (Say, 1822).*Nassarius polygonatus* (Say, 1822).*Nassarius albus* (Say, 1826).*Nassarius albus* authors, not
(Say, 1826).*Nassarius antillarum*
(d'Orbigny, 1842).*Nassarius consensus* (Ravenel,
1861).*Nassarius paucicostatus*
(Marrat, 1877).*Nassarius dentate* species A*Nassarius dentate* species B*Nassarius candidissimus* (C. B.
Adams, 1845).

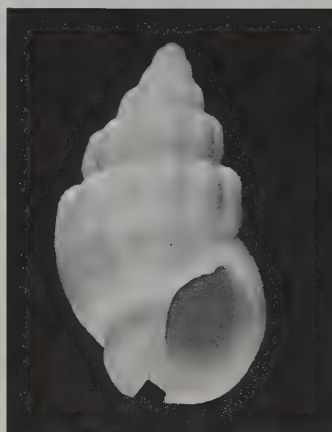
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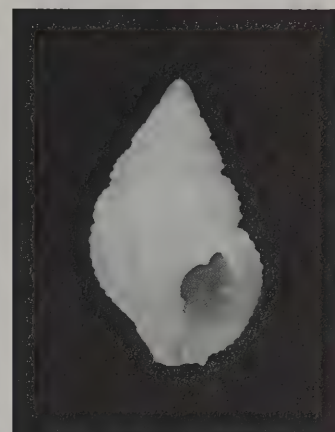
Nassarius cf. candidissimus (C. B. Adams, 1845).



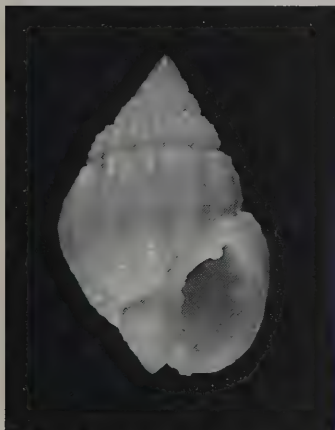
Nassarius capillaris (Watson, 1882).



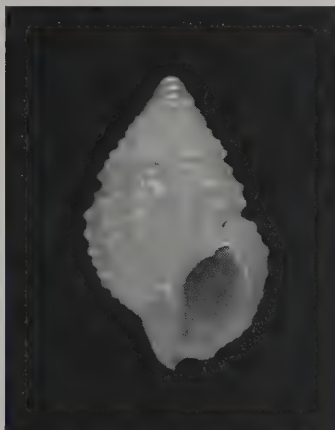
Nassarius kaicherae de Jong and Coomans, 1988.



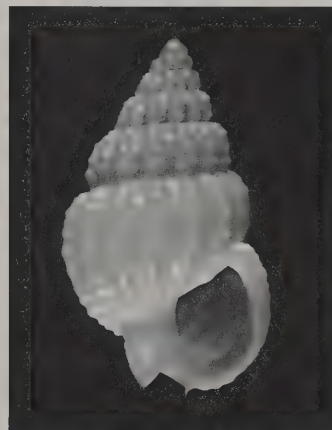
Nassarius hotessieri (d'Orbigny, 1842).



Nassarius hotessieri authors, not (d'Orbigny, 1842).



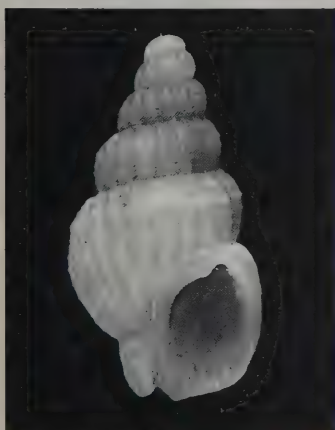
Nassarius cf. scissuratus (Dall, 1889).



Nassarius pernitus (Dall, 1889).



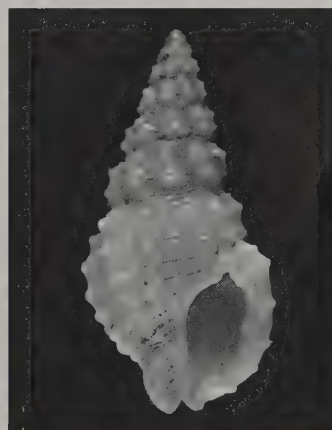
Nassarius compertus Fernández-Garcés, Espinosa, and Rolán, 1990.



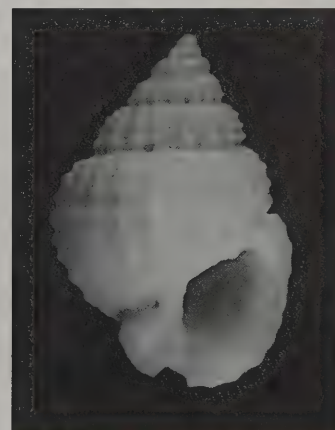
Nassarius karinae Nowell-Usticke, 1971 candidate no. 1.



Nassarius karinae Nowell-Usticke, 1971 candidate no. 2.



Nassarius acutus (Say, 1826).



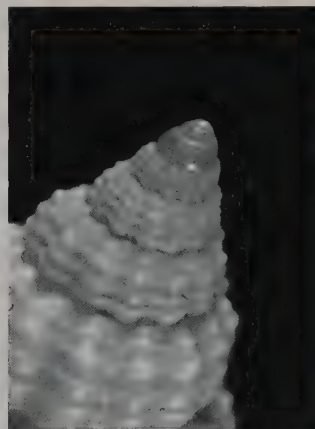
Nassarius coppingeri Rios, 1995, not (E. A. Smith, 1881).



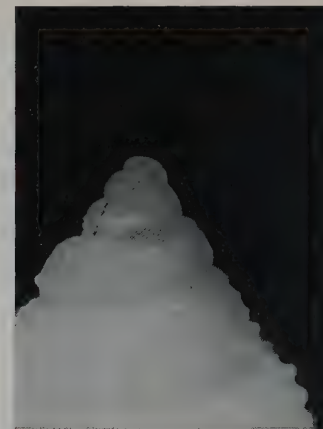
Nassarius albus authors, not (Say, 1826) protoconch.



Nassarius antillarum (d'Orbigny, 1842) protoconch.



Nassarius albus (Say, 1826) protoconch.



Nassarius coppingeri Rios, 1995, not (E. A. Smith, 1881) protoconch.

WESTERN ATLANTIC NASSARIIDAE

by Harry G. Lee

In the course of curating my Western Atlantic Nassariidae, I encountered, natch, dilemmas in delineating taxa, finding names for them, and reconciling my samples with the available taxonomic literature. The status of my resolution, which I do not vouchsafe as infallible, is revealed in the "centerfold" of members of this greatly under-rated and misunderstood group, whose diversity is **certainly** underappreciated (a couple more apparent species have been received while "in press."). I shall deal briefly with the taxa as I see them. This presentation is based on a talk I gave at C.O.A. '98 at Orlando.

Size: 3 to 7 mm. - small; 7-15 mm. - medium; 15-30 mm. - large. Protoconch types (when salient): globose crawl-away: see *Nassarius albus* authors photo; conical crawl-away: see *N. antillarum* photo; polyspiral planktotrophic: see *N. albus* Say photo. Shallow water unless stated; deep means over 50 fathoms.

1. *Ilyanassa obsoleta* (Say, 1822). Large; one of the most abundant of all marine gastropods; inhabits intertidal mudflats from Newfoundland to E. Central Florida.
2. *Ilyanassa trivitatta* (Say, 1822). Large; occurs in backwaters but can prosper offshore to several fathoms; range as above.
3. *Nassarius vibex* (Say, 1822). Medium; confused with 4.; see illustration for differences in the parietal shield, especially its antero-ventral (southwest) aspect; Cape Cod to the Yucatan - including ALL of Florida.
4. *Nassarius polygonatus* (Say, 1822). Medium; see preceding, with which it often occurs in range overlap; N. E. to S. W. Florida; Bermuda; all West Indies; Yucatan to Brasil.
5. *Nassarius albus* (Say, 1826). Medium; polyspiral protoconch (q. v.); see several species (6., 7., 8.), with which it has been confused; NC to Brasil; Bermuda; all West Indies.
6. *Nassarius albus* authors, not (Say, 1826). Medium; globose crawl-away (lecithotrophic) protoconch; teleoconch resembles 5., 7.; Southeast Florida to Brasil; Bermuda; all West Indies.
7. *Nassarius antillarum* (d'Orbigny, 1842). Medium; conical crawl-away protoconch (q. v.); teleoconch resembles 6., Southeast Florida; Bermuda; all West Indies; Yucatan(?) to Brasil.
8. *Nassarius consensus* (Ravenel, 1861). Medium; polyspiral protoconch; fine spirals (vs. 5.); South Carolina to Yucatan except southern tip of Florida.

9. *Nassarius paucicostatus* (Marrat, 1877). Medium; globose protoconch; well-developed parietal ornamentation; Southeast Florida; Yucatan to Colombia; all West Indies.

10. *Nassarius dentate* species A. Small to medium; polyspiral protoconch; Gulf of Mexico; shallow to deep water.

11. *Nassarius dentate* species B. Medium; polyspiral protoconch; deep water; Barbados.

12. *Nassarius candidissimus* (C. B. Adams, 1845). Medium; rapidly-expanding conical, crawl-away (?) protoconch with strong axials; on teleoconch spiral sculpture becomes obsolete; Bermuda, Honduras; Jamaica; Aruba.

13. *Nassarius* cf. *candidissimus* (C. B. Adams, 1845). Small to medium; protoconch like preceding but with more crowded axials; Bermuda.

14. *Nassarius capillaris* (Watson, 1882). Medium; polyspiral protoconch; teleoconch with five delicate spirals above and below each major one; often solid orange; ABC Is., Brasil; shallow to deep water.

15. *Nassarius kaicherae* de Jong and Coomans, 1988. Medium; large conical oligospiral protoconch; Puerto Rico and ABC Is.

16. *Nassarius hotessieri* (d'Orbigny, 1842). Small; polyspiral protoconch; S. E. Florida and Antilles.

17. *Nassarius hotessieri* authors, not (d'Orbigny, 1842). Medium; polyspiral protoconch; South Carolina to Yucatan; deep water, occasionally as shallow as 30 fathoms.

18. *Nassarius* cf. *scissuratus* (Dall, 1889). Small; polyspiral protoconch; polished; Florida Keys; 30 fathoms. Typical *N. scissuratus* from Barbados; deep water.

19. *Nassarius pernitidus* (Dall, 1889). Medium to large; polyspiral protoconch; Barbados and Brasil; deep water.

20. *Nassarius compertus* Fernández-Garcés, Espinosa, and Rolán, 1990. Small, globose protoconch; Cuba.

21. *Nassarius karinae* Nowell-Usticke, 1971 candidate no. 1. Small; globose crawl-away protoconch; Bahamas.

22. *Nassarius karinae* Nowell-Usticke, 1971 candidate no. 2. Small to medium; globose crawl-away protoconch; Puerto Rico; Venezuela.

23. *Nassarius acutus* (Say, 1826). Small to medium; NC to Yucatan except southern half of peninsular Florida; Haiti.

24. *Nassarius coppingeri* Rios, 1995, not (E. A. Smith, 1881). Medium; rapidly-expanding shagreen-textured protoconch (q. v); Brasil to Argentina; shallow to deep.

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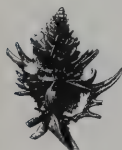
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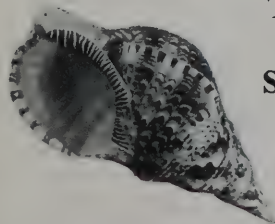
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HAROLD ERNEST VOKES

June 27, 1908 — September 16, 1998

by Emily H. Vokes

Harold E. Vokes, retired Professor of Geology, Tulane University, passed away September 16, 1998, at Heritage Manor Nursing Home in Hammond, Louisiana, following a long illness. He was 90 years old. Dr. Vokes is survived by his wife Emily, four children and six grandchildren.

Harold went to New Orleans in 1956 to replace the retiring Chairman at Tulane University's Department of Geology, and to establish a graduate program in the department. He served as departmental chairman from 1957 to 1966.

Prior to going to Tulane Harold was associated with a number of prestigious institutions. Following his doctoral degree in 1935 from the University of California, Berkeley, he received a Post-Doctoral fellowship at the Peabody Museum, Yale University, under the mentorship of the great Carl Dunbar. Professor Dunbar was so impressed with his ability that he recommended Harold for a post as Assistant Curator of Invertebrate Paleontology at the American Museum of Natural History, New York. He held this position from 1937 to 1941, when he was promoted to Associate Curator of Fossil and Recent Invertebrates, which position he held until 1943.

With World War II upon us, Harold felt that he could contribute something more to the war effort than identifying fossils and he became Senior Geologist for the U.S. Geological Survey, searching for Uranium in the Green River Desert. He continued as a WAE (when actually employed — i.e., summertime) for the Survey until 1956, mapping the Coast Range of Oregon, and looking for gas and oil beneath the Columbia Lava Plateau.

After the war Harold turned to academics, taking a position at the Johns Hopkins University, where he taught from 1945 until 1956, when he went to Tulane University. He remained at Tulane until his retirement in 1978, and was named W.R. Irby Professor of Geology in 1972.

Dr. Vokes' early work varied from the Eocene marine fossils of California and freshwater bivalves of India, to the Cretaceous mol-



A more recent photo of Harold and Emily working in a drawer of the Vokes Collection in their office at Tulane.

luskus of Lebanon, based on material collected while he was a Guggenheim fellow studying the geology of the Lebanon Mountains.

During his professional career he served a number of societies, being Secretary of the Paleontological Society from 1940 to 1949 and President in 1951. He served as Secretary to the International Paleontological Union from 1949 to 1958. He was a member of the International Commission of Zoological Nomenclature from 1944 to 1978, and a Fellow of the Geological Society of America for over 50 years, serving as Vice-President in 1952. He was long associated with the Paleontological Research Institution, being a member of the Board of Directors, Vice-President, and finally President in 1974-1976.

In 1952-1953 he took leave from Johns-Hopkins to serve as Geological Consultant to the Philippine Bureau of Mines to study coal deposits in the Cebu and Mindanao areas (during which he also availed himself of the opportunity to collect the fabulous Recent molluscan fauna). Subsequently he served as Malacologist on the 9th Indian Ocean Cruise of the *Anton Bruun* and Chief Scientist for her Cruise 10, from Florida to Panama. In 1971, while on sabbatical leave from Tulane he was a visiting professor of Paleontology at the Universidade Federal, Rio Grande do Sul, Brazil.

Under Dr. Vokes' guidance Tulane University became one of the premier institutions for the study of Cenozoic fossils, primarily of the Gulf and Atlantic Coastal Plain. He was responsible for the founding of *Tulane Studies in Geology and Paleontology*, which for 35 years published works on the fauna of the western Atlantic, especially the Chipola, Pinecrest, and Caloosahatchee formations of Florida.

Although he was forced to retire from teaching at the then mandatory age of 70, he continued to do research until failing health curtailed his activity. In the 60 years between 1935 and 1995 he published about 130 scientific papers (not including numerous abstracts and reviews), the most valuable of which unquestionably was his *Genera of the Bivalvia*, first published in 1967, with a revised edition in 1980, and a final addendum in 1990. In these papers he named over 200 species and 29 genera of invertebrates.



Harold, Emily and a geological map of Mexico in the early 1960's.

I Remember Harold

by Emilio F. García

He was not an armchair malacologist. In my mind, he belonged to that generation of great 19th century explorers who went where the action was. I remember listening to him and Emily in my living room talking about their experiences on collecting trips: sleeping in hammocks in an old house in Holbox Island while researching their book on marine mollusca of Yucatan; collecting fossils in the Dominican Republic, and on, and on. How many times did I wish I had been there?

I first saw his name when (it seems like a thousand years ago) I ordered his monograph, *Genera of the Bivalvia*. At the time it was very difficult to find anything on the subject and I was very glad to get such an important work. Who would have guessed that many years later he would be in my house autographing that same book for me.

I remember meeting Harold for the first time when we started the Louisiana Malacological Society and Emily came to give a talk. He stayed very much in the background and I considered him a rather shy person. This impression lasted only until he and Emily came to visit me one week end. I never would have imagined that Harold knew so many jokes! From then on, every time he came to one of our meetings, he would rush to tell me his latest.

Harold and Emily shared a large, two-room office at Tulane University. I remember going there a number of times to discuss problems with Emily, bring specimens or collect specimens. Most of the time Harold would be sitting at his desk, doing his research, and ignoring us totally as we passed back and forth to look for specimens in the drawers that were on his side of the office. Only if he had a question for Emily, or if it was lunchtime, would he deign to look up. He would not even tell me a joke. If it was lunchtime, we would rush to a nearby hole-in-the-wall restaurant, their favorite, to eat some incredibly exquisite poboyos. (Only in New Orleans can one eat like that in places like those!)

I got closest to Harold when we started traveling together. I remember our joint birthday celebration in Bali, when the lights of the large restaurant were turned off and turbaned waiters filed to our table by candlelight singing "Happy Birthday"; and I remember Harold and Emily wearing their twin collecting uniforms (long sleeve shirts and light tan pants) while floating over an incredibly beautiful coral reef off Tioman Island, Malaysia, and Emily saying: "This is what we came here for." And I remember him looking in awe, as we all did, at the magnificent temples of Pagan, Burma. But I remember him best when we went to the Philippines.

In 1952 Harold went on a long molluscan research expedition to that wonderful country. While there, he engaged a Filipino man to accompany him to the best areas for mollusks and to help him collect. They were together all the time Harold spent in the Philippines. His name was Evaristo Zambo. When Harold finally left the Philippines, he left all the household items he had acquired in the Philippines with Mr. Zambo but, more importantly, he left behind a shell connoisseur.

135 Oak Crest Drive, Lafayette, LA 70503 Email: efg2112@usl.edu

MANUEL MONTILLA DIES

It is with great sorrow to inform you that Mr. Manuel O. Montilla, my husband and a former member of this club (COA), passed away because of a heart attack last August 10, 1998. Despite his death, we are still continuing our business.

Respectfully yours,

Mildred M. Montilla

59 Maria Clara Street, Quezon City 1114, Philippines



"Most of the time Harold would be sitting at his desk, doing his research, and ignoring us totally...."

We are all acquainted with *Homalocantha zamboi*, named for that now famous shell dealer.

When, more than a quarter of a century later, Harold went back to the Philippines to visit his old friend, he was received by Mr. Zambo and his family like royalty. We were wined (or the Filipino equivalent) and dined and taken everywhere we wanted to go in Mr. Zambo's car. Even today's Punta Engaño shell dealers, having heard the story, received us in awe. They acted as if the patriarch of all Filipino shell dealers had arrived. And why not? After all, Harold had taught Mr. Zambo.

I remember Harold best in this context because it gives me an appreciation for both his present and his past as a malacologist; it gives me a more complete understanding of the man. And because I was incredibly fortunate to receive some of the specimens that he had collected during those idyllic times: his own handwritten labels, his own data, his own dates. I remember very well my feelings of nostalgia for experiences I did not live when I transferred the data of each of those labels into my catalogues: *Exotica obliquistriata*, Liloan, December 26, 1952; *Emarginula pulchra*, Bignogkalan, January 6, 1953; *Eucythora subterranea*, Zamboanga, July 4, 1953....

Yes Harold, on the Fourth of July, forty-five years ago, you were bending down in some beach in exotic Zamboanga to pick up a beautiful little turrid which I can enjoy today. And remember you as I do so.

CHANNELLED WHELK IN CA?

Glen and Laura Burghardt of Oakdale, CA report that the Channelled Whelk, *Busycon canaliculatum*, has indeed been introduced to California and that they have found and photographed it in San Francisco Bay on the mudflats along the San Mateo County coast as well as from deeper waters in the Bay and along the city of Alameda shoreline.

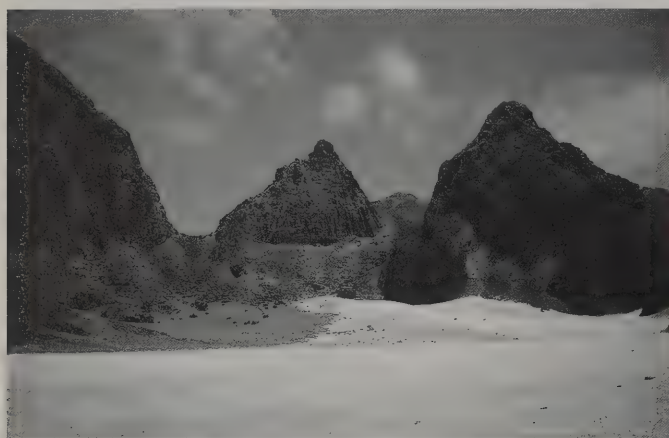
The total value of the abalone fisheries and abalone culture around the world is up to \$600 million dollars annually.

THE BRASILIAN CONNECTION

Let's Go Shelling in Brasil - Part III

by José Coltro

Along the Brazilian coast we have many islands — most of them close to the shore. But Brasil has some oceanic islands — quite distant from the coast: Trindade Island (not Trinidad, from Trinidad & Tobago!), Martin Vaz group, Fernando de Noronha Archipelago,



Hills around Tartaruga Beach, Trindade Island

Rocas Atoll, São Pedro and São Paulo Islands and Parcel Manuel Luis.

Trindade is in the southern Atlantic. It is about 1000 km east of Vitoria, Espírito Santo State. It is an edge of an extinct volcano. The island is really interesting — we were there in 1988 with the Brazilian Navy who have a small base there. The island is 8.2 square kilometers and is covered by hills — the highest is 600 meters high. Very rocky, the island looks like Mars, with colored hills, each hill a different form and color — black, red, brown, yellow, etc. On the island's few beaches, thousands of sea turtles come every year to lay their eggs. It is one of the most important turtle sites on the entire Brazilian coast. The big problem is that huge crabs infest the island and they eat the young turtles.

The island is also an important point for the reproduction of a half dozen species of sea birds. During the XVIII century, the English Navy introduced some goats there and now they are wild and very destructive. They wiped out the entire original flora; now most of the island has a kind of grass and a small forest of giant ferns. The island has few insects, but two of them are special: a giant spider — about 15 cm, and a giant cockroach more than 12 cm long! There is no port and all the services between the base and the Navy ship need helicopters or a lot of patience using a kind of small boat attached by cables between the ship and a point on the beach. The sea is really rough most the time.



Nerita ascenciones trindadensis on rocks at low tide.

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Around Trindade there are few easy spots to collect shells. Some natural pools with very clear water are great for *Cypraea acicularis* Gmelin, 1791 and *Cypraea cinerea* Born, 1778. Almost every rock has dozens of *Nerita ascenciones trindadensis* Vermeij, 1970. Some endemic or rare species are found there, like *Synaptocochlea picta* (Orbigny, 1842); *Vanikoro oxychone* Morch, 1877; *Collisella marcusii* (Righi, 1966); *Arene boucheti* Leal, 1991 and *Caducifer atlanticus* Coelho, Matthews & Cardoso. During our trip we found one land shell — *Bulimulus trindadensis* Brueke & Coelho, 1976. All specimens were found dead and we believe that this species is extinct, since it was never found alive.

There are two ways to go to Trindade: one is using the Brazilian Navy, another is using your own boat. Each second month the Navy sends a ship to change half of the base crew and to supply food, gas, etc. They normally permit 8 visitors to travel to the island and there is a waiting list at the main base in Rio de Janeiro. Using your own boat, it is necessary to acquire a permit from the Trindade's base captain to go to the island. Besides being a Brazilian military area, there are no restrictions for non-Brazilians and they normally welcome all visitors.

Just 50 km east of Trindade is Martin Vaz Group. It is a cluster of small and very steep and rocky islands. Only sea birds live on the rocks. It is one the most mysterious sites for shells, because nobody has collected any species there at shallow water. Some deep dredging brought some curious species, especially in the Turridae family. The islands have no beaches, no access, except by using helicopters to land in the top (about 250 meters high).

Going north, about 300 km NE of the Brazilian State of Rio Grande do Norte, is the Fernando de Noronha Archipelago. It is one of the most beautiful places in Brasil. The archipelago has a large island with some small islands and islets around. With a large area, about 26 square kilometers, the big island has gorgeous beaches, beautiful hills, some small forests, and the only mangrove island in the entire South Atlantic.



South part of Trindade Island

The archipelago has almost 500 years of history. It was a Portuguese settlement and pirate base during the XVI and XVII centuries. It has some old buildings, like the old XVII century fort and a XVIII century church. The main island was a political jail at the beginning of this century.

Since 1988 Fernando de Noronha has been a National Park, and it is very protected. There are about 2,000 inhabitants. The local authorities allow a limit of 400 tourists per week. The island has a small airport with daily flights to Natal or Recife. There are small hotels and pensions in the main village of Remedios and on some of the beaches.

Fernando de Noronha is a great place for shells, but since it is a National Park, a special permit to collect is necessary. This permit is

really hard to get and normally only biologists get it for scientific purposes. Nice species, like the endemic volute *Enaeta guildingii leonardhilli* (Petuch, 1988), *Fissurella emmanuelae* Metivier, 1970 and *Collisella noronhensis* (E.A. Smith, 1990) are easily found. The islands have some of the most beautiful black *Conus regius* Gmelin, 1791. The shell is normally huge and almost completely black. And it lives in shallow tide pools! It is possible to find some species of land shells, including the fantastic *Hyperaulax ramangei* (E.A. Smith, 1990).

Northeast of Fernando de Noronha, about 900 km from the coast, there are the small islands of São Pedro and São Paulo. These two small islands are the rocky tops of two sea mountains. No vegetation, only birds and guano! This is one of the most likely places for new species, because nobody had done any research or shelling ever! The islands belong to a geological site separated from the Brazilian Basin by a large abyssal plain. Probably the entire fauna has a very local development. Recently, the Brazilian Government built a small scientific station to start to do some research. They found that the islands have daily earthquakes and sometimes the waves cover the station....

Between Fernando de Noronha and the continental coast there is the only South Atlantic atoll: Rocas. It is a fantastic place, since most of the atoll is made by shells from the family Vermetidae, especially *Dendropoma irregulare* (Orbigny, 1842). The atoll is also a National Park and it really hard to go there. The only chance is by private boat

and a special permit to land is necessary. If your intention is just to hang around diving, the permit is not necessary.

Some fantastic species are found there, like *Cypraea surinamensis* Perry, 1811 or *Malea noronhensis* Kempf & Matthews, 1969. The water around the atoll is really rich in fishes like big sharks! It is a home of more than a dozen sea birds and two or three species of turtles. The atoll is grass-covered and there is a small building for the Brazilian Nature and Park Service. Nobody lives there. The regular dry area is 7.2 square kilometers, with a large lagoon and some small ones.

On the north Brazilian coast, there is one of the most unknown and unexplored places of our coast: Parcel Manuel Luis. It is a group of dangerous rocks 200 km north of São Luis, State of Maranhão. This formation is the tops of rock towers, and the ocean around them is full of sea life. The currents are really strong and it is very hard to dive. Probably it is a great place for shells but no research has been done. Since the Amazonas Rives delta is not far, about 400 km, the place is greatly influenced by fresh water. One can only go there using one's own boat or renting a fishing boat in São Luis.

The Brazilian oceanic islands have some endemic and very individual fauna. As I've pointed out, most of them are really hard to visit but if you have any chance, all of them deserve a try. The entire Brazilian coast has some great places for shells; some are not far from the large cities; others are almost impossible to reach. If you have the opportunity to come, take it! You'll never regret it!

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Jun. 27 - **CONCHOLOGISTS OF AMERICA ANNUAL
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Philadelphia 1998: A Weekend to Remember

by Richard Kirk

For shellers in the Northeast and increasingly from everywhere else, the Philadelphia Shell Show was, this year, a not-to-be-missed event. Run by the Philadelphia Shell Club and hosted by the Academy of Natural Sciences of Philadelphia, this year's show, November 7-8, was momentous for several reasons. The Len Hill and Pilsbry Awards were presented for the first time; Dr. Geerat Vermeij gave a keynote lecture; and the Academy of Natural Sciences launched an endowment campaign for malacology.

There was a nostalgic note to the show, held on the anniversary of the death of Len Hill. Last year Len had been so much himself and enjoyed the event to the fullest. Little did his friends know, it would be the last time we would see him. Len's life was commemorated by the presentation of the first annual Len Hill Award. Given to the most beautiful scientific exhibit, the award is a beautiful crystal bowl designed by Sue Hobbs and etched with Len's beloved pecten shells. The Len Hill Award went to Gene Everson, whose "David and Goliath" exhibit was a most magnificent and beautiful display, a fitting tribute to Len's memory.

The big question was whether it was possible to win that most prestigious but all too elusive Pilsbry Award. At the end of the award presentations, Dr. Gary Rosenberg whisked the famous crystal vase adorned with *Latiaxis pilsbryi* from its box and announced, "This year, we have our first Pilsbry Award winner!" You could hear a pin drop as Gary announced that the award went to Eleanor and Bill Marr, first time exhibitors in a shell show, for their exhibit, "The Fossils of Palm Beach Rock," in which they described a fossil pit with key species from the Bermont Formation. This pit with its precious contents was only open for a few short months and would have been lost to science but for their careful work. Their research and presentation brought shell show displays to a new level, and have set a new standard and challenge for all of us, narrowing the gap between amateur and professional admirably.

But the 1998 Philadelphia Shell Show went down in history for yet another, even more important reason! The Academy of Natural

4419 Larchwood Avenue, Philadelphia PA 19104. jsrk@erols.com

Shellers Tour the Smithsonian

(Continued from page 12)

the Pleurotomariidae, including specimens from Yoshihiro Goto, co-author of *The Living Pleurotomariidae*, and specimens collected by Department Curator Dr. Jerry Harasewych during submersible expeditions in the Bahamas over the past 10 years. We also viewed some specimens from the extensive Bill Bledsoe collection. This collection is reputed to have been one of the most spectacular recent collections ever amassed in the U.S. for rare shells; it was a coup for the department to now have it as part of their holdings. A coffee table shell book by Jerry Harasewych, highlighting the Bledsoe collection, was published by the museum.

Having viewed some of the highlights of the collection, we were then led to other parts of the department. We had a chance to look at some of the original hand-written collection catalogs, dating back to the beginnings of the museum. Raye showed us the very first catalog, containing the first entry written by William Stimpson in the mid-1800s. These rare documents, housed in an empty office not far from the collections room, are crumbling. However, they will not be lost; the museum recently received a grant to restore these rare historical volumes. About one quarter of the entire collection is now com-

puter cataloged — that includes all specimens cataloged since 1979, all the 11,000+ primary type specimens, and all research collections. Raye and her co-workers are currently making an inventory of all secondary type material.

The group also spent some time viewing the wet collection, where specimens are stored in alcohol, followed by a tour of the library. After that, Raye pretty much "let us loose." A few of us broke off to do some research in the library. But most of us stayed in the collections room, either exploring the thousands of drawers containing a dizzying array of specimens, or chatting with Raye. During the visit, Jerry Harasewych, who was in the office that day working on a scientific paper, dropped in for a surprise visit with the group.

The group did not come empty-handed; several members of the tour presented the museum with a specimen of *Conus nigromaculatus*. In addition, Rich Goldberg donated a variety of rare *Amphidromus* from eastern Indonesia and Bill Fenzan gave the museum a specimen of *Cypraea fultoni*. We would all like to thank Rae Germon, Jerry Harasewych and Laura Kahler for their generosity in opening up the doors of the department for our group, especially on a beautiful Saturday afternoon when they could have been pursuing some outdoor activities.

Support and endowment will enable the Academy to serve future generations as in the past. At the banquet, Harvey Forman, Trustee of the Academy and head of the Campaign for Malacology, and Dr. Paul Hanle, President of the Academy, underscored the importance of acting now to preserve and extend the life and work of this important institution. Hanle and Forman were followed by a keynote presentation by Dr. Geerat Vermeij, world renowned author and educator. Vermeij, truly a Renaissance man with a world view, affirmed the value of the natural sciences in facing the tough challenges of the 21st century. He stressed that his studies of the natural history and evolution of shells would not be possible without museum collections, and that those studies have led him to conclude that humans must plan for a future of limited, sustainable resources rather than the ever-expanding growth that economists expect.

It was an extraordinary weekend by any standard. We left with a renewed sense that we must work to extend the bounds of our collective knowledge of the ever shrinking, ever more delicate planet we call home.

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CONCHATENATIONS

Conchological Quotations

by Gary Rosenberg

Why, you might take to some light study: conchology, now: I always think that must be a light study.

—George Eliot, 1872, *Middlemarch*, chap. 30, p. 320

For many years I have collected conchological quotations. They appear surprisingly often, once one is attuned to them. I find references of mollusks in about one quarter of the novels I read, although not all are truly quotable. Dictionaries of quotations provide another means to pursue my quarry. Others I have winkled from the pages of the *Oxford English Dictionary*, which, in addition to definitions, gives examples of use of words. Recently it has become possible to search the works of various authors on the Internet. For example, the complete works of Shakespeare are available electronically, as are many of the novels of George Eliot (the pen name of Mary Ann Evans).

Thus far I have found conchological quotations by more than 70 authors in more than 100 works. The leaders of the field are Shakespeare with 20, George Eliot with 13, and Charles Dickens and Lewis Carroll, tied at 5 each. The predominance of British writers might be sampling bias, or it may reflect the British passion for natural history. The selection below prefers prose to poetry, restricts each author to one quotation, and presents at least one instance of each subject word that I have encountered: *clam*, *cockle*, *coquillage*, *conchology*, *cuttlefish*, *geoduck*, *limpet*, *malacology*, *molluscous*, *mollusk*, *monomyarian*, *mother-of-pearl*, *murex*, *mussel*, *nautilus*, *octopus*, *oyster*, *paua*, *quahog*, *scallop*, *shell*, *slug*, *snail*, *squid*, *whelk*, and *winkle*. I welcome suggestions to be added to the collection.

The scientific celebrities, forgetting their molluscs and glacial periods, gossiped about art, while devoting themselves to oysters and ices with characteristic energy....

Louisa May Alcott, 1868, *Little Women*, chap. 34

The released mind revolves, flashing different colours like a paua.

Sylvia Ashton-Warner, 1958, *Spinster*, p. 162

Men took a great pride...in fattening their different coquillages, not so much...with a view to the increase of the malacology within, as to produce enormous shells.

Charles D. Badham, 1854, *Prose Halieutics*, 38

...the unicorn sometimes thought that the three of them must look as blind as slugs in the sunlight, with their log or their dark rock tumbled away.

Peter Beagle, 1968, *The Last Unicorn*, p. 81

'Do you know that childhood is the only time in our lives when insanity is not only permitted to us, but expected?' asked the doctor rhetorically. 'If I went crawling around for snails I would be taken to Piraeus and locked up.'

Louis de Bernières, 1994, *Corelli's Mandolin*, chap. 8, p. 46

What marvel, that we have sold our birth-right to an acephalous mollusk, when the simple use of the tongue has passed into such headless mongrelism?

Richard Blackmore, 1884, *Tommy Upmore II*, ii. 17

'God! what a beauty! what a lovely charming thing!' he exclaimed. 'Haven't they raised it on snails and sour milk, Nelly? Oh damn my soul! but that's worse than I expected — and the devil knows I was not sanguine!'

Emily Brontë, 1847, *Wuthering Heights*, p. 169

From whom am I to take my marching orders? From men who fancy they are Admirable Crichtons,...but who have not got sufficient brains and ability to run a whelk stall?

J. Burns, 1894, in *South-Western Star*, 13 Jan. 3/4

If you make an allusion to monomyarian malacology, it will not naturally be supposed to have reference to the cooking of oyster sauce.

John Hill Burton, 1862, *The Book Hunter*, 2

Led his troops with furious gallops,
To charge whole regiments of scallops.

Samuel Butler, 1678, *Hudibras*, iii. 365

The first man gets the oyster, the second man gets the shell.

Andrew Carnegie

The further off from England the nearer is to France —
Then turn not pale beloved snail, but come and join the dance.

Lewis Carroll, 1865, *Alice's Adventures in Wonderland*

But what really brought things to a head was when she put a lot of slugs in his bed. He had a queer aversion for slugs. He lost his temper completely and said that the girl had to be sent away to school. He wasn't going to put up with all this petty nonsense any more.

Agatha Christie, 1941, *Murder in Retrospect*, chap. 6, p. 97

There came the snail from his shell peeping out, As fearful and cautious as thieves on the rout.

John Clare, 1821, *The Village Minstrel II*, p. 32

Words today are like the shells and rope of seaweed which a child brings home glistening from the beach and which in an hour have lost their lustre.

Cyril Connolly, 1944, *The Unquiet Grave*, pt. 3

If I had clung on, the waiting Phrygians would simply have rolled the sedan chair onto its side and tackled the problem like poking a limpet to death inside its shell.

Lindsey Davis, 1991, *Venus in Copper*, chap. K, p. 202

He argue-bargues with you like a winkle that won't come out of its shell.

William F. De Morgan, 1906, *Joseph Vance*, xxiii

Scrooge! a squeezing, wrenching, grasping, scraping, clutching, covetous old sinner! Hard and sharp as flint, from which no steel had ever struck out generous fire; secret, and self-contained, and solitary as an oyster.

Charles Dickens, 1843, *A Christmas Carol*

And seeing the snail, which everywhere doth roam,
Carrying his own house still, still is at home,
Follow (for he is easy paced) this snail,
Be thine own palace, or the world's thy gaol.

John Donne, 1651, *Letters to Several Personnages*

It was he...who had got me the biggest clam shell in my collection and, moreover, with the two tiny parasitic pea-crabs still inside.

Gerald Durrell, 1978, *Garden of Gods*, iv. 88

Slowly the slug started up the steep surface, stringing behind it scribble sparkling like silk.

Pamela Duncan Edwards, 1996, *Some Smug Slug*, p. 7

But if he had really shown her any testamentary tenderness, it would be affecting to think of him, poor man, when he was gone, and even his foolish fuss about the flowers and garden-stuff, and his insistence on the subject of snails, would be touching when it was once fairly at an end.

George Eliot, 1860, *The Mill on the Floss*, p. 193

A mollusk is a cheap edition [of man] with a suppression of the costlier illustrations, designed for dingy circulation, for shelving in an oyster-bank or among the seaweed.

Ralph Waldo Emerson, circa 1870, *Power and Laws of Thought*
He had often eaten oysters, but had never had enough.

W. S. Gilbert, 1866-1871, *The 'Bab' Ballads*

They were fourteen years old; geoducks were important. It was summer and little else really mattered.

David Guterson, 1995, *Snow Falling on Cedars*, chap. 8, p. 95
An octopus is a hideous, baggy, slimy, thoroughly disgusting creature. Which is worse, its sharp beak hidden within folds of soft flesh, its pod-like eyes, its flaccid sack, or its bumpy tentacles? Some have cited it as proof that God did not create the universe, but, at a distance, swimming smoothly through the water, it's as graceful as a prima ballerina. Sectioned under a microscope, it presents patterns of inexhaustible brilliance. And to an octopus of the opposite sex, or even an adolescent squid who needs someone after whom to model himself, it can be handsome or beautiful, as the case may be.

Mark Helprin, 1991, *A Soldier of the Great War*, p. 221
The Court delayed to pay them, and their affairs, in German phrase, travelled "by the snail post."

Edward Holmes, 1845, *The Life of Mozart*, p. 29
It's largely conjecture on my part of course,— he's about as confiding as an oyster! — but I fancy I have said some things in a conditional way that will give him pause.

William Dean Howells, 1886, *The Minister's Charge*, chap. 21, p. 209
Torch-bearers...all having their lights burning out of whelks, or murex shells.

Ben Jonson, 1605 (1616), *Masques*, Of Blacknesse Wks. 894
He could speak with any resident adult in any language, but more notable was his ability to understand the chattering squirrels and chipmunks, the silent signals of the ants and beetles, and the slithy semaphores of the slugs and worms that moved above and through his earth.

William Kennedy, 1983, *Ironweed*, chap. 1, p. 17
If you won't believe my great new doctrine...that souls secrete their bodies, as snails do shells, you will remain in outer darkness.

Charles Kingsley, *Letters*, 1863 (1878) II. 172
Is he trying to run a motion through under cover of a cloud of words, essaying the well-known "cuttle-fish trick" of the West?

Rudyard Kipling, 1891, *The City of Dreadful Night*, p. 18
Reclining in molluscous languor upon a mother-of-pearl reading-lounge...

William S. Mayo, 1873, *Never Again*, xxix
The world is an oyster, but you don't crack it open on a mattress.

Arthur Miller, 1949, *Death of Salesman*, i. 39
Of the crow-blue mussel shells, one keeps adjusting the ash heaps; opening and shutting itself like an injured fan.

Marianne Moore, 1935, *The Fish*
...more and more litter from the cosmic spheres will attach itself to you, shrouds, clothes, excrescences, snails, dead weight, covering your awareness of the original light, until you at last fall into the dark dungeon of spirit and flesh and are finally born as a human being.

Harry Mulisch, 1992, *The Discovery of Heaven*, p. 190
He dreamed of mellowing his pigments as the Old Masters had done — with honey, fig juice, poppy oil, and the slime of pink snails.

Vladimir Nabokov, 1957, *Pnin*, p. 67
I do not know what I may appear to the world; but to myself I seem to have been only like a boy playing on the sea-shore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me.

Attributed to Isaac Newton, *Brewster's Memoirs of Newton*, Vol. 2. Chap. 27
He opened a bottle of Bols and searched for aspirin in his canvas bag. He always carried a good supply, together with books, pencils, pens, half-filled notepads, a Swiss Army knife, a passport, money, a bulging address book, and books belonging to himself and to others. He could, at any time, disappear without a trace like a snail into its shell.

Arturo Pérez-Reverte, 1993, *The Club Dumas*, p. 70

The gritted wave leaps
The seawall and drops onto a bier
Of quahog chips.

Sylvia Plath, 1960 *Colossus*, p. 24

Learn of the little nautilus to sail,
Spread the thin oar, and catch the driving gale.

Alexander Pope, *Essay on Man*, Epistle iii, line 177.
The stones clenched lost nets, beaten onto hairy frazzles of mussel shells and seaweed.

E. Annie Proulx, 1993, *The Shipping News*, chap. 26, p. 208
Oysters are more beautiful than any religion...There's nothing in Christianity or Buddhism that quite matches the sympathetic unselfishness of an oyster.

Saki, 1911, *The Chronicles of Clovis*
...a broad and shadowy hat, with cockleshells stitched on its brim...

Walter Scott, 1819, *Ivanhoe*, iv:35
Canst tell how an oyster makes his shell?...
Nor I neither; but I can tell why a snail has a house.

William Shakespeare, *King Lear*, Act 1, Scene 5
An oyster may be crossed in love.

Richard B. Sheridan, 1799, *The Critic*
I'd rather be a sparrow than a snail.

Paul Simon, 1970, "El Condor Pasa"
It is perhaps a more fortunate destiny to have a taste for collecting shells than to be born a millionaire.

Robert Louis Stevenson, 1911, *Lay Morals*
He was a bold man that first eat an oyster.

Johnathan Swift, 1738?, *Polite Conversation*
Be limpets to this pillar, or we are torn down the strong wave of brawlers.

Alfred, Lord Tennyson, 1875, *Queen Mary*, III, i
Adopt the character of the twisting octopus, which takes on the appearance of the nearby rock. Now follow in this direction, now turn a different hue.

Theognis, ca. 545 B.C.E., *Elegies*, I. 215
It will be lost on such an intellectual clam as you.

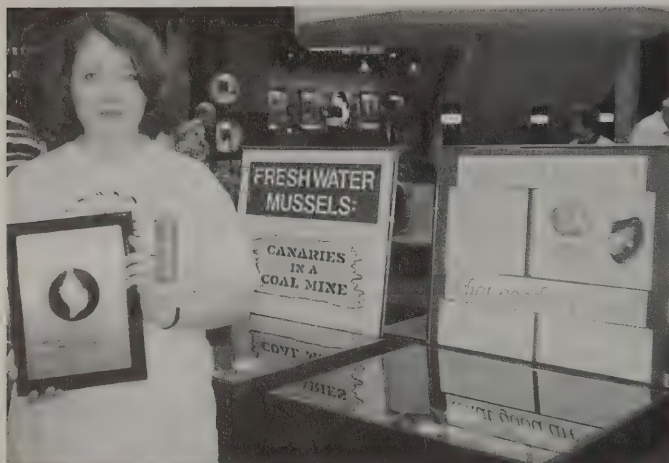
Mark Twain, 1871, *Sketches*, I. 46



Hydatina zonata (Lightfoot, 1786) - Found intertidally on the "Wild Side" of Algoa Bay, Port Elizabeth, South Africa. They are really rare here, says the lucky photographer, Mariette Jeary of Port Elizabeth, South Africa.

COA TROPHY WINNERS

Edited by Charlotte Lloyd



COA member Karen Couch (above) won the COA Award at the Greater St. Louis Shell Show held April 24-25. Fifteen hundred visitors viewed Karen's winning exhibit, "Fresh Water Mussels — Canaries in a Coal Mine." Her educational exhibit of Unionid mussels described physiology, ecological importance, and reasons for their endangered status. Great job, Karen!

The Keppel Bay Shell Club held its Show on July 11-12 of this year. The COA trophy was awarded to the Best Display by a club. This Division is limited to 35 shells from a local shell club area. Winners Mrs. I. Prowse, Mrs. E. Coucom and Jean Offord each contributed some of the 35 exhibited shells. Maybe these deserving winners will also share housing for the coveted COA Award. Congratulations to all.

The Jacksonville Shell Club Show was held June 24-26 of this year in St. Augustine, FL. Jim and Linda Brunner traveled to the ancient city with their 20' exhibit, "Gathering in Guaymas." Their exhibit showed shells collected from one geographic area and their efforts were rewarded with the COA Trophy. Way to go Brunners! →

LETTERS:

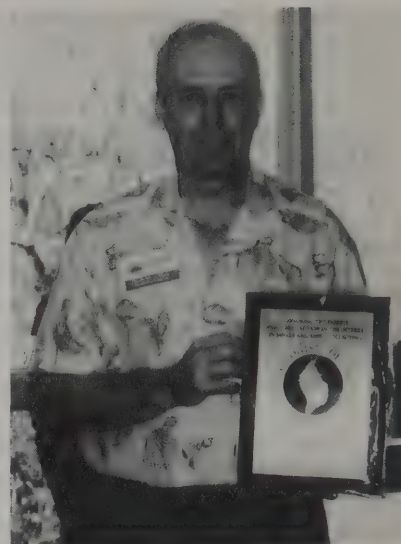
Collecting in Mexico Can be a Risky Proposition. Kim Hutsell reports the following: A word of caution about collecting in Baja...The Mexican authorities are REALLY cracking down on shell collecting in Baja, especially around Loreto. The entire area has been designated as a reserve and they are enforcing the shell ban. A group of shellers from S. California just returned...empty handed...because everything was confiscated. They were really quite lucky that only the shells were impounded and not their gear, boats, and cars, as well.

If you go to Baja to collect, you are taking an enormous risk. Don't let anyone tell you that it's no big deal or that you won't get caught. Some USA citizens are working with the Mexican authorities, reporting the activities of shellers from north of the border.

If you absolutely must collect in Baja, GET THE PROPER PERMITS!!! Permits are NOT issued to casual collectors and commercial permits run several hundred dollars. If you plan to go with a group and are told they have the permits, ask to see them. If you're told you don't need a permit, well...I've passed by the territorial prison in Baja many times. Believe me...you DON'T want to be there!

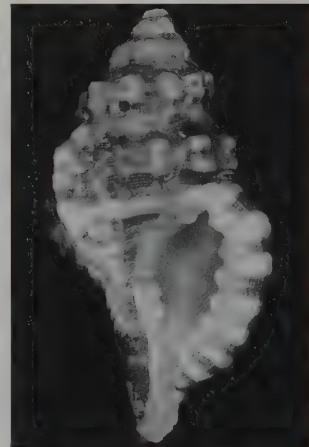
Kim Hutsell, 5804 Laurretta Street #2, San Diego, CA 92110-1670
khutsell@ix.netcom.com

Gene (Super-sheller) Everson has put together another award winning exhibit entitled "David & Goliath." His 36 foot display shows adult and tiny juvenile examples of 263 species of gastropods and bivalves. He took the COA Award at the North Carolina Shell Expo on September 18-20 with this outstanding exhibit and we understand it also won the duPont in November at the Philadelphia Show. Another outstanding job Gene, and what we have come to expect from you. (Photo by Vicki Wall)



WHAT IS IT?

Marcus Coltro sends us a photo of this unknown *Cymatium* from Margarita Island.



OOPS!!

J.M. Inchaustegui alerted us to the fact that caption information in Emily Vokes' article on *Murex margaritensis* in the September issue [26(3) p. 4] is reversed. The caption for the four shells on the lower right should read: Size comparison of *Phyllonotus margaritensis* Amuay Bay (top) and Isla Margarita (bottom).

Kentucky Fossils: THE FALLS OF THE OHIO

by Gene Everson

The world's largest Devonian fossil outcropping is The Falls of the Ohio, located at Louisville, Kentucky. A wonderland of long extinct rugose fossil corals, brachiopods, trilobites, crinoids and primitive mollusks, the Falls is a mecca for fossil fans the world over.

The "Falls" are actually cascading rapids, dropping 26 feet in a 2-1/2 mile stretch of the Ohio River. Four hundred million years ago, the area where the Falls of the Ohio is today was covered by a shallow, tropical, inland sea. Within this huge sea vast numbers of corals thrived, and the most highly evolved life forms on earth were primitive fish: the earliest sharks and the armor-plated *Dunkleosteus*. During Devonian times, before the shifting of the continental plates to their present position, this area was 20 degrees south of the Equator, accounting for its tropical marine fauna. Colonial corals like *Favosites* were encountering competition from the many evolving types of solitary rugose or "horn" corals (*Zaphrentis*, *Siphonophrentis* and others). Carnivorous cephalopods, in coiled or uncoiled shells, flourished in this sunlit sea, hunting in the shallow beds of brachiopods and primitive bivalves (*Paracyclas*), and among the multiform trilobites of the time.

At the end of the Devonian, this inland sea and reef ecosystem were doomed by the collision of two tectonic plates, which drained the shallow sea. The fish, the corals and other sea life died, to be buried in layers of lime silt and sediments that caused them to become fossilized. They remained hidden in the earth for hundreds of millions of years until, during the retreat of the ice age glaciers of the Pleistocene, rush-



Falls of the Ohio Interpretive center has a unique exterior designed to resembles geologic strata.

ing meltwater carved out the Ohio River Basin and exposed the Devonian fossil beds. The resulting exposure provides a unique view of an ancient coral sea floor preserved in stone. Today the Falls of the Ohio is recognized as a valuable resource and is protected as a State Park and a world historical site. Some falls area facts:

- More than 600 species of fossils have been described at the Falls, two-thirds of them type specimens.
- The primitive paddlefish is one of the 125 species of fish found at the Falls. Two of these unique paddlefish are currently on display swimming in one of the Interpretive Center's aquariums.
- Over 265 species of birds have been recorded at the Falls.
- John James Audubon made more than 200 sketches of birds while living in the Falls area.

- Mark Twain and Walt Whitman both wrote about the Falls of the Ohio.

- In 1778, George Rogers Clark founded on Corn Island at the Falls the first permanent English-speaking settlement in the Northwest Territory.

- William Clark, younger brother of George Rogers Clark, set out from here with Meriwether Lewis on their mission to explore the territory of the Louisiana Purchase.

After several attempts to preserve and protect the area, the 20th Indiana State Park was established in 1990. Now, fossil, rock and mineral collecting is prohibited. Tours are available and the Falls of the Ohio now has a unique Interpretive Center: its exterior, constructed of many layers of different brick and stone colors and textures, suggests a geologic column.

The 1999 COA Convention in Louisville will sponsor a mid-convention field trip to the Falls of the Ohio on Tuesday, June 29. The Park is a mere 10 minutes away, just across the Ohio River from the Galt House, our convention hotel; its unusual Interpretive Center is visible from the hotel.

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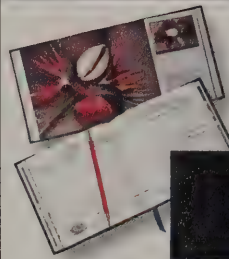
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AMERICAN CONCHOLOGIST

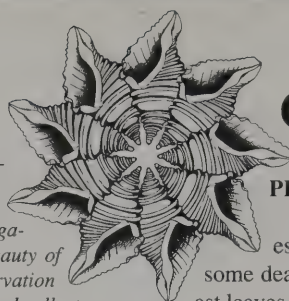
QUARTERLY JOURNAL OF THE CONCHOLOGISTS OF AMERICA, INC.

VOL. 27, NO. 1

MARCH 1999

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CONCHOLOGISTS



OF AMERICA, INC.

VOL. 27 No. 1 MARCH 1999

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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MEMBERSHIPS are for the calendar year, January-December, late memberships retroactive to January. **1999 DUES:** (USA, Canada, Mexico) \$20.00; **Postal Surcharge:** \$10.00 for other Western Hemisphere nations; \$12.00 for Europe; \$15.00 for Asia, Africa and the Pacific Rim. Please pay in U. S. dollars with a check drawn on a U. S. bank with Transit Enrouting and Account Numbers printed at the bottom, or with money order; make checks payable to CONCHOLOGISTS OF AMERICA. **NEW MEMBERS** apply to Doris Underwood, **MEMBERSHIP DIRECTOR**. **RENEWALS** go to **TREASURER**, Bobbie Houchin. **BACK ISSUES** are available from **PROPERTIES DIRECTOR** Hank Foglino, 4 Trent Court, Smithtown, NY 11787-1266. Prior to 1985 \$3.00 each; 1985 to current \$5.00 each.

PRESIDENT'S MESSAGE

COA is a collective bound together by a common interest...shells. Some members are collectors, some scientists, some dealers and, yes, some are true naturalists. Where one enthusiast leaves off, another carries on. The most unique aspect of this group is the members' willingness to share information without passing judgment on the value of another's knowledge. We all work to learn more about the world of shells and their evolution, and to project as to the future of shell study and collecting. This takes all types of people with a variety of goals. COA is glad to help each individual in any way we can.

The organization provides several forums by which we share information. One is this magazine. Another is the Conch-L listserve. Still another is Conch-Net. But perhaps the best forum is our annual convention. This year the convention has no host club. COA is hosting its own convention. To do this it needs every member to pitch in and help and I know you will not let the organization down. Many of you are already involved in the planning of the convention. Many of you have donated shells and related items. We appreciate each gift of time and auction donations. If you haven't volunteered an auction item or scheduled a time to work, please do. After all, a convention, just like a club meeting, is what you make it. Don't wait to be asked. If you are unable to be there and help, please take the time to thank those who are. They need to know that their work is appreciated.

In another vein, if there is a cause you believe in, get involved. Don't be a critic; get organized, learn the issues, create solutions and enlist the advice of professionals in our hobby. Be a participant.

Bid and silent auction items are still needed if we are to continue our educational grants program. Donations are being collected by Jim Brunner.

So that Gene Everson, Bobbie Houchin, Charlotte Lloyd and Lynn Scheu don't collapse before the convention, contact them about a job.

Do you have something to talk about? Contact Tom Watters. It's not too late. He's still filling in his presentation program. Many of you keep your lights under a bushel...tell Tom what you know.

The horses are gathering at the starting gate. Don't be left out!

Linda Brunner

IT'S CONVENTION DONATION TIME AGAIN!

COA auctions are the second most important source of income for the organization. As membership dues (the largest money raiser) basically cover only the cost of printing and mailing your issues of *American Conchologist*, the auctions have to fund all other activities of the organization, including our Grants Program. Last year's event was in record setting territory and we hope to be there again in 1999. But we can't do it without your donation. We welcome any type of donation from shells to books to shell related items and shell craft. The auction committee reserves the right to assign your donation to either the silent or bid auction.

Send all donations to Jim Brunner, PO Box 8188, Southport, FL 32409 and the earlier the better, because it takes me forever to get them all logged. Just a personal thought: As it is Louisville, Horse Conchs should be a hot item this year!

COVER CREDITS: Ross Gundersen, Associate Professor of Biological Sciences at the University of Wisconsin, Parkside and invaluable staff member of *American Conchologist*, has created a digital wonder for us: a Jamaican sunrise as seen from the Hofstra Marine Laboratory in Priory, Jamaica. The superimposed bivalve, complementing the orange in the sunrise, is the beautifully rayed *Tellina laevigata* Linnaeus, 1758.

Convention '99 Field Trips

By Gene Everson

The 1999 Louisville Convention will offer five field trips. The first, the only field trip scheduled during the convention, is a visit to the Falls Of The Ohio fossil beds and museum, detailed in the December *American Conchologist* (p. 31). We leave the Galt House Hotel at 9 a.m. Tuesday, June 29. Tennis shoes or old shoes are recommended if you want to walk on the fossil beds. This trip is a must for anyone who has not been here before. We will depart The Falls at 11:30 a.m. for lunch on your own at the Kingfish, a seafood restaurant at the edge of the Ohio River, with a scenic view of our hotel and the Louisville skyline.

Traditionally the convention ends with the banquet, held this year on Thursday, July 1. Those who stay another day have a choice of four field trips planned for Friday, July 2.

1. The Kentucky Derby Museum. Depart the Galt House at 9 am and return around noon. The Derby Museum is located at Churchill Downs, home of the Kentucky Derby. The museum features a 360° screen, multi-image film highlighting Derby Day, from morning workouts of the horses, to the race itself. The racing trophies on display make shell show trophies pale. You see how the starting gates work, look at mock-ups of horse stalls with all the currying tools and equipment to care for the horses, learn about racing silks, view videos of famous races, and much more. Weather permitting, a guide will take you to the track and explain the track composition, track traditions and anecdotes of notable races. There is a gift shop featuring equestrian memorabilia.

2. Bardstown, KY. Depart the Galt House at 8:30 a.m., returning late afternoon. Bardstown is a historic town in the heart of distillery country, about a 45 min. drive south of Louisville. We will tour the National Register of Historic Places Makers Mark distillery outside Bardstown, then return to Bardstown for a tour of My Old Kentucky

500 Nottingham Parkway, Louisville KY 40222-5026 (502)429-5788 Email to amconch@ix.netcom.com will reach Gene.

COA-WALTER SAGE FUND REPORT

by Bobbie Houchin, COA Treasurer

COA is pleased to announce that Virginia Michelitti contributed \$25.00 and the Cen Penn Beachcombers contributed \$300.00 to the Walter Sage Fund #1. The final segment of the shell fabric from Walter Sage's collection will be sold at the June 1999 COA Convention in Louisville and proceeds will be added to the Walter Sage Fund #2. The very much appreciated contributions and fabric sales help the funds to grow. One-half of the accumulated interest can be awarded as Grants to deserving recipients. The total amount in the two Walter Sage Funds is \$14,751.60. THEY ARE GROWING!

If you would like to make a contribution to malacology in Walter's memory, please make your check payable to COA and say it is for the Walter Sage Fund #1. Send it to Bobbie Houchin, COA Treasurer, 2644 Kings Hwy., Louisville, KY 40205-2649. Please be aware that, at this time, contributions to COA are not deductible from your income tax.



FIELD MUSEUM LIBRARY

Home, where Stephen Foster was inspired to write that song they play preceding every Derby. Lunch is available across the street at Kurtzes', an old stone restaurant serving reasonable and delicious traditional Kentucky food. After lunch, you will have a couple of hours to explore the area as you desire: a new and really fine Civil War museum featuring relics of the Western Theater of the war (admission - \$4.00); St. Joseph's Protocathedral, the oldest cathedral west of the Alleghenys (free); the Getz Museum of Whiskey History and Bardstown Museum (free); a clutter of antique shops along Main Street and more.

3. Freshwater and possible terrestrial shell collecting trip. Depart the Galt House at 9 am. Most of the cost of this trip is for prorating the collecting permit. Water levels permitting we will visit a site to collect freshwater mussels and snails. Although we will attempt to visit shallow, wadeable sites, be prepared to get wet!

Collecting gear should include wading shoes or waders, goody bag, and a keen eye. A glass-bottomed bucket would be a plus. Snorkling also is possible. Please bear in mind that no live mussels or endangered species in any condition may be taken. This trip will be led by Dr. Tom Watters, renowned expert on the Unionidae.

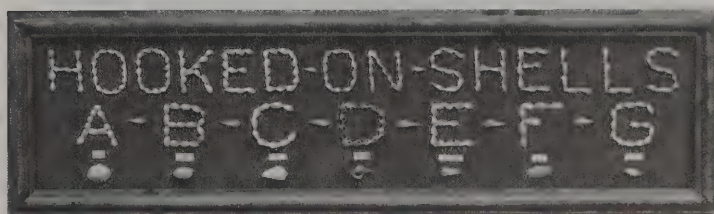
4. Fossil collecting trip. Depart the Galt House at 9 am. This trip will visit Ordovician/Silurian strata of the Liberty and associated formations. In addition to corals and an occasional *orthoceras*, the primary target is brachiopods, including intact (both valves of) *Platystropha ponderosa*, and specimens of *Rafinesquina*, as well as several other less common brachiopods and a few true bivalve mollusks. The equipment needed is primarily a sturdy screwdriver (this is a cherry-pick! from soft strata!) and appropriate safety equipment. Safety needs are the responsibility of the individual, but safety glasses and sturdy shoes should be considered the minimum. A cheat sheet identifying the fossils that we expect to find will be provided. Trip limited to 12 people. This trip will be led by Dr. Terry Davis, a medicinal chemist working in the Biomaterials Technology Center of 3M in St. Paul, MN. He is a Louisville native. As a shell collector, he specializes in Muricidae, Pectinidae, Ranellidae and Turbellinellidae.

Spotlight on the Clubs...

By Betty Lipe

The Grand Strand Shell Club in the Myrtle Beach area of South Carolina interacts with people in several ways. The club has formulated shell collections for each of the 14 high schools in Horry County, as well as collections for other institutions. One member gives talks and demonstrations to groups who request shell information. The club also exhibits shells to thousands of people in malls, and art and craft festivals. At these exhibits, another of their members exhibits vertical displays of shell families, shell signs (see picture below) and shell art which contribute to a spectacular and educational wall of shells.

—From information submitted by Bill Tilley,
President of the Grand Strand Shell Club.



DO WHAT YOU LOVE!

by Ross Gundersen

Photos and photo editing by the author



Fresh specimens of *Zebina browniana* (d'Orbigny, 1842) with their beautiful spiral marking of golden brown.

It really is a rare event when your vocation and avocation overlap one another. I am a university professor who teaches a course in field marine biology, introducing students to the design and conducting of field research. Every year, for 10 years running, we have gone to the Hofstra Marine Laboratory in Priory, Jamaica. Priory is on the north coast of Jamaica, about 8 miles west of Ocho Rios. After my first year running the course, I decided to have fun and survey the mollusks in the marine environment surrounding the laboratory.

The marine environment in close vicinity to the laboratory is very diverse. Within one mile are sand flats, Turtle Grass beds, mangrove swamps, a rocky flat, and a living coral reef: in short, a mollusk haven and scientific collecting heaven. Every year I find new mollusks. After nine years my list of mollusks has grown to above 600, including the cephalopods, opisthobranchs and nudibranchs.

Get your imaginations in gear. Let's take a walk and find some mollusks. Wading through the Turtle Grass beds is quite an experience! You find a lot of mollusks by literally tripping over them. *Vasum muricatum* (Born, 1778) abound, along with *Strombus gigas* Linné, 1758 juveniles and *Strombus gallus* Linné, 1758. *S. gallus* are quite



Elysia sp. and *Smaragdia viridis* (Linné, 1758) on a blade of Turtle Grass. Both are very difficult to see in their natural environment.

Department of Biological Sciences, University of Wisconsin, Parkside, Box 2000, Kenosha, WI 53141 Email: gundersr@uwp.edu



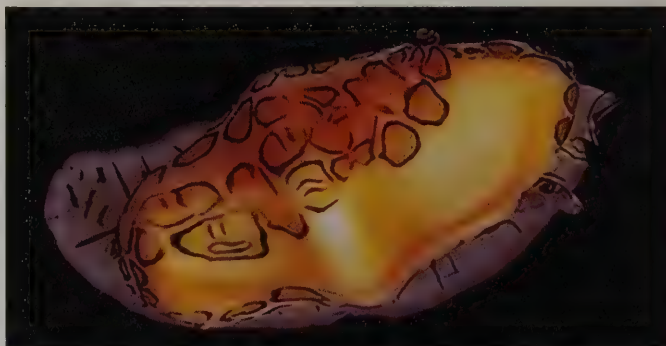
Neritina virginea (Linné, 1758) showing their wide range of patterns.

common inhabitants of the grass beds of Priory. The largest specimen I have seen is 8 inches long. Always pick up the bivalves you notice if both valves are present. Gently pry apart the valves. If you are lucky you will be looking at *Octopus joubini* Robson, 1929. It attaches four arms to each valve and holds them together: a perfect place to hide safely during the day.

There are a lot of smaller mollusks in the grass beds to be collected by running a fine net through the grass. When your net is full, pick it up and look inside, but be careful: you might have a Gold-spotted Eel. These eels are rather beautiful and innocuous, but can nip when cor-



An unhappy *Octopus briareus* Robson, 1929 reluctantly posing for a photography session in a plastic box.



Cyphoma gibbosum (Linné, 1758), a perennial favorite, usually found munching on sea fans.

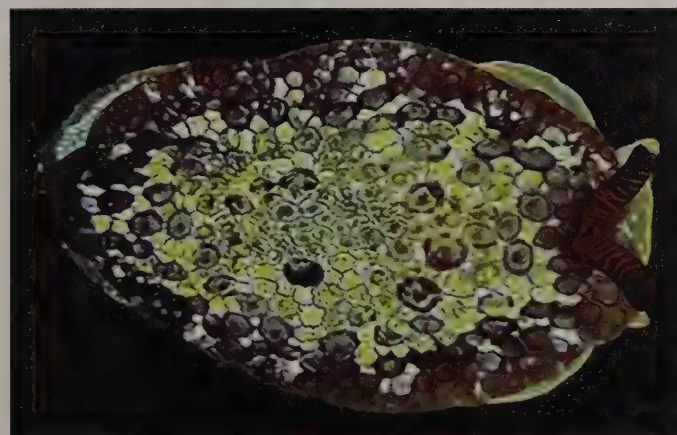
nered. One thing you definitely do not want to have in your net is a large Porcupine Fish. They inflate with air or water and literally become stuck in the net! Imagine a spiny soccer ball with its spines sticking through the net material. After you remove any unwanted tenants from your net (actually a mini-course in marine biology) you will find a veritable grab bag of smaller mollusks.



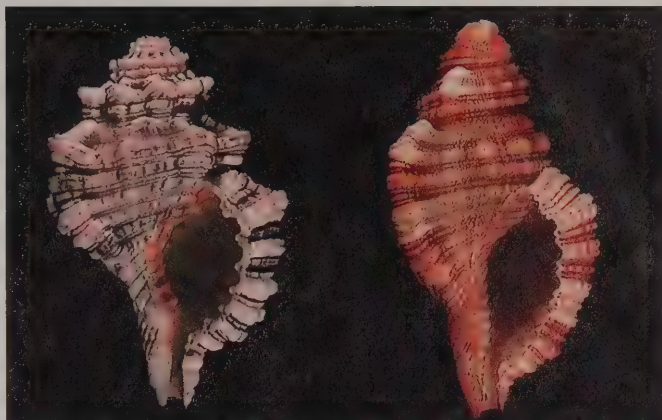
Tricolia thalassicola Robertson, 1958: abundant in Turtle Grass beds and exhibiting a wide range of colors.

My personal favorite is *Smaragdia viridis* (Linné 1758). When alive, both the shell and the living animal are a beautiful bright green. You will also have numerous tricolias such as *T. bella* (M. Smith, 1937) and *T. thalassicola* Robertson, 1958. Smaller *Zebina browniana* (d'Orbigny, 1842) will also be encountered: not the white bleached specimens, but the living animal with a translucent shell decorated with spiral bands of golden brown. If you put the contents of the net in a bucket of water, other mollusks will become apparent. Crawling up the sides you will observe *Elysia ornata* (Swainson, 1840), *Navanax aenigmaticus*, *Chromodoris* sp. and *Stylocheilus longicauda* (Quoy and Gaimard, 1824).

As you continue walking through the Turtle Grass you will come to a sand flat surrounding a rocky flat. During the day the sand flat looks deserted, but at night it comes alive. You will commonly find *Prunum apicinum* (Menke, 1828), *Prunum guttatum* (Dillwyn, 1817), *Olivella minuta* (Link, 1807), *Oliva reticularis* Lamarck, 1811, *Natica livida*



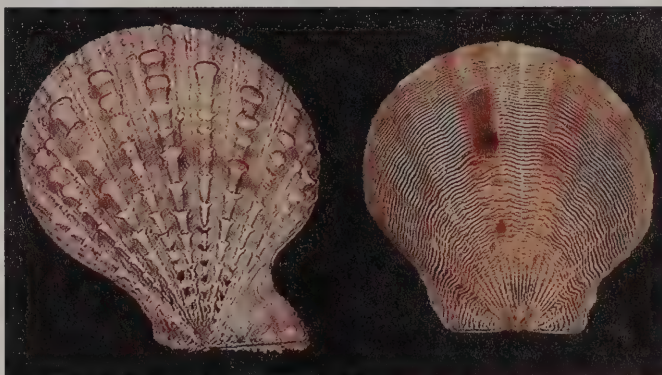
Pleurobranchus areolatus Mörch, 1863 found in deeper grass beds and exhibiting the characteristic low, rounded, multicolored mamillae.



Cymatium nicobaricum (Röding, 1798) and *Cymatium martinianum* (d'Orbigny, 1845) frequently found in rocky flats in shallow water.

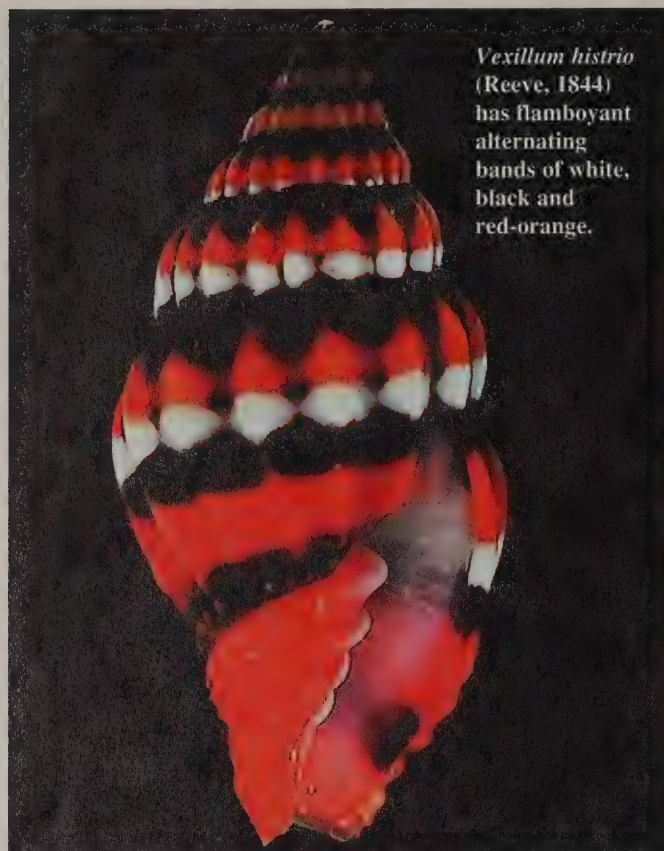
Pfeiffer, 1840, *Naticarius canrena* (Linné, 1758) and *Cypraeacassis testiculus* (Linné, 1758). While none of these is rare they are all beautiful and it is interesting to watch them cruise in and out of the sand in search of food.

One can also observe a school of *Sepioteuthis sepioidea* (Blainville, 1823). Their iridescent colors are captivating as they ripple across their bodies. Another chance encounter is with *Octopus briareus* Robson, 1929 and *Octopus macropus* Risso. 1826. I once picked up an *O. macropus* and got the shock of my life. It turned bright red with white polka dots. In addition it would not let go of my arm and proceeded to bite me three times! I had to lie down in the water to get the octopus to let go. Needless to say my arm and human physiology did not appreciate the venom. That same night one of my students yelled after being forcefully pushed by an unseen assailant which turned out to be a Loggerhead Turtle with a shell length of 30 inches. The student was vastly out-weighted in this shoving contest.



Chlamys imbricata (Gmelin, 1791) is usually found under dead coral; *Aequipecten lineolaris* (Lamarck, 1819) can be collected in deeper grass beds associated with the reef.

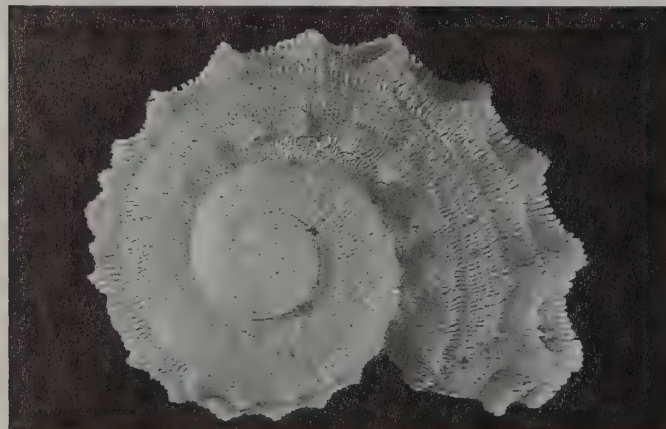
The sand flat gives way to the rocky flat. If you like to hunt mollusks underneath rocks this is the place. Frequent finds include *Vexillum histrio* (Reeve, 1844), *Cymatium martinianum* (d'Orbigny, 1845), *Cymatium nicobaricum* (Röding, 1798), *Bursa granularis* (Röding, 1798), *Caribachlamys ornata* (Lamarck, 1819), *Caribachlamys sentis* (Reeve, 1853) and immature *Charonia variegata* (Lamarck, 1816). There are two color forms of *C. variegata* in Jamaica, the typical color form of muted brown/beige and an orange color form. The immatures of the orange color form are really a screaming orange and quite spectacular. Other smaller mollusks encountered will be *Zafrona pulchella* (Blainville, 1829), *Nitidella*



Vexillum histrio
(Reeve, 1844)
has flamboyant
alternating
bands of white,
black and
red-orange.

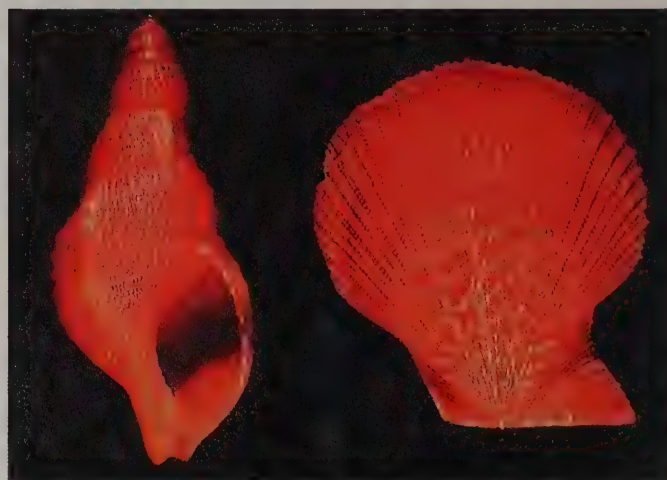
nitida (Lamarck, 1822), *Engina turbinella* (Kiener, 1835), *Arcopsis adamsi* (Dall, 1886) and *Barbatia domingensis* (Lamarck, 1819). There are spectacular non-molluscan inhabitants underneath the rocks: brittle stars. The most common of these is the Blunt-spined Brittle Star. We once found 21 of these stars underneath one small flat rock.

At the outer edge of the rocky flat the coral reef begins. Whether you are looking for mollusks or not, a living coral reef is breathtaking. Yellow and purple sea fans abound along with various *Diploria/Meandrina* brain corals, *Montastrea* boulder corals, *Millepora* fire corals and *Porites* finger corals. Spend some time inspecting the sea fans. Common inhabitants will be *Cyphoma gibbosum* (Linné, 1758), *Cyphoma signatum* Pilsbry & McGinty, 1939, *Coralliophila caribaea* Abbott, 1958 and the all but invisible *Cymbovula acicularis* (Lamarck, 1811). These little simnias assume the color of the sea fan they are feeding on and so almost disappear on their hosts. Turning over dead coral can be very productive. Common



Arene venusta (Woodring, 1928) (4 mm) with its delicate surface ornamentation which can only be appreciated by using a microscope.

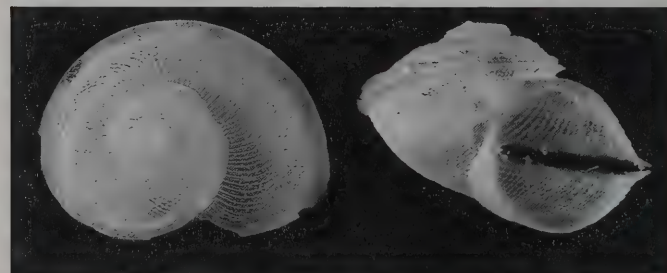
inhabitants here are *Cypraea cinerea* Gmelin, 1791 and *Cypraea acicularis* Gmelin, 1791. A real find is my favorite scallop: *Chlamys imbricata* (Gmelin, 1791). Their beautiful nodular ornamentation and subtle changing colors are quite engaging. Another scallop can be found in the deeper grass beds of the fore reef: *Aequipecten lineolaris* (Lamarck, 1819). Those of you who are interested in chitons will observe *Stenoplax purpurascens* (C. B. Adams, 1845), and *Acanthochitona spiculosa* (Reeve, 1847). If you take a sample of the coral sand you can find many micromollusks: *Arene venusta* (Woodring, 1928), *Iniforis turristhoniae* (Holten, 1802) and *Sinezona* sp. Be on the lookout for octopus dens; these avid shell discarders have made it easy for me to find many shell specimens. In Jamaica a typical octopus den will be littered about with *Turbo castanea* Gmelin, 1791 and *Arcopagia fausta* (Pulteney, 1799). These are apparently the favorite octopus finger food or, in this case, arm food. Be prepared to find discard piles which show a specialty gourmet octopus. My favorite pile was the octopus specializing in *Cypraea*.



The orange color forms of *Charonia variegata* (Lamarck, 1816) and *Caribachlamys sentis* (Reeve, 1853).

Last, but not least, are the mangrove areas. While not pleasing to your sense of smell, mangrove areas can be quite productive places to find mollusks. In and among the cover of *Halimeda* (a calcareous jointed green alga), you will find *Pinna carnea* Gmelin, 1791. Digging your hands into the muck will yield excellent specimens of *Periglypta listeri* (Gray, 1838). *Phyllonotus pomum* (Gmelin, 1791) can be observed in abundance within the prop roots. Also to be found is the magnificent *Melongena melongena* (Linné, 1758) busily looking for snacks of *Isognomon radiatus* (Gmelin, 1791). *Neritina virginea* (Linné, 1758) are seen in sandier areas associated with mangroves. Talk about a mollusk which can't make up its mind about what color or pattern to apply to its shell! The sky is the limit.

For now our imaginary walk is done, and I await the day to return to Jamaica's wonderful people, scenery and shells. SOON COME!



Sinezona sp. (1.5 mm), a member of the family Scissurellidae, has beautiful arched axial and spiral cords. This shell was previously in the Pleurotomariidae because of a slit associated with the aperture.

LOOKING DOWN THE NOSE OF AFRICA: A SHELLING EXPEDITION TO SENEGAL

by Mariette Jearey

Photographs edited by Ross Gundersen

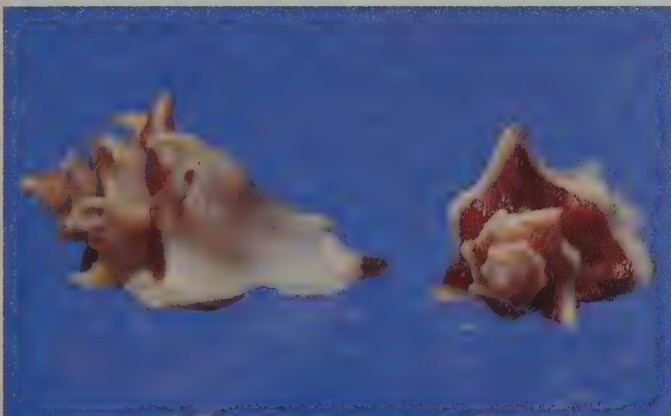


Purpurellus gambiensis (Reeve, 1845) from Goree Bay.

Photo by Charlotte Lloyd.

Astounded, I stared around me. I had never seen anything like this in an airport before. Bags of corn and potatoes, crates of tomatoes, huge hessian bags of secret soft things (material or wool), a huge box of latex gloves, what looked like half a lamb in a butcher's bag, and many other unmentionable items. Not the kind of travellers' paraphernalia one would normally see at the departure counter! Would they ever allow all of this on the plane, even if it would fit on the plane? All this was accompanied by the buzz of busy, strange languages. I started to doubt the sanity of what I was doing. I heard a voice behind me talking on a cell phone in Afrikaans. At last, some sense in all of this travel frenzy! The only other person on this flight who spoke one language that I could understand. But my newfound confidence was shattered when I finally got to the counter and the young girl serving us asked in a very tired voice: "What on earth are you doing on this crazy flight? Are you nuts?!" Can you believe I was standing in the Johannesburg Airport!

22 hours after leaving home we landed at the Dakar airport. Excitement was bubbling inside of me at the prospect of seeing old friends. After what seemed like another hour, I finally got my luggage, which gave me enough time to notice all the other strange luggage coming through, some looking rather soggy, as is to be expected of veggies that have travelled thousands of miles across the equator! Sure enough, there was the half lamb in the butcher's bag, looking rather



Typhis sowerbyi (Broderip, 1833) from Goree Bay.

Photo by Charlotte Lloyd.

bloody and travel weary. And there were Gene and Sylvain waiting, not so patiently, in the foyer! Welcome to Africa, my friend, the time here ticks slower than anywhere else in the world!

"Damn, things take long in this place! How are you? I can't wait to show you the things I have dived this morning! Tomorrow morning we're going to the same place again. I can't wait to see your face after the dive. This is Sylvain. He'll be our translator and guide during the trip." All of this in almost one breath, and only after that, "Hello, good to see you again!"

Early the next morning I took a walk to acquaint myself with my new habitat. Tall and very black men and boys, dressed in brightly coloured robes, clutching prayer mats under their arms, were all heading off in the same direction, the sun was rising, the sea a stunning azure blue. On the beach were slender little girls, long hair tightly platted against their heads, playing on proudly painted canoes. Strutting on the beach, very white sheep, like gypsophylis in a spring flower arrangement. Boys and young men dragging the sheep, much against their wills, into the sea and washing them there. I tried to communicate with the little girls in my very limited French, but when that did not work, clowning around and singing with them brought out the desired reaction.

It took a while for all this colour to seep in and, still in quite a daze, I got to meet my old shell-swapping friends over a cup of coffee. Homer and Anne at first meet are the most organized shelling travellers I have ever met. Nothing was forgotten. Every possible and even unlikely event was provided for. I knew there and then that amongst these three friends, I could sap buckets full of travel knowledge and shelling enthusiasm and precision. I wasn't proved wrong.



Marginella c.f. harpiformis (Sowerby, 1846) from Pointe Sarene.

Photo by Charlotte Lloyd.

Ten o'clock arrived and we were off in a sport fishing boat. Jean-Jacques, a French-speaking Belgian, the owner of the boat, takes tourists (mostly from Europe) on "big fish hunting" charters. Taking crazy amateur conchologists diving was not normal fare. (Especially three Americans and one South African.) This delightfully colourful character told us so many traditional stories of Senegal that one would believe he had lived here all his life, instead of just a few years. Africa and hunting are his passion!

Jean-Jacques took us to Madelaine Island, a little south-east of Dakar. There is some fascinating and romantic folklore involved with these stark rocks jutting out of the blue sea. The water was clear, even though the cold bit a little, and the surge was quite strong around the island's feet. At 14 meters I found my first shell, a *Cypraea stercoraria*! Now I understand why one hardly ever finds these shells in a gem condition. Man, they live on the "wild side" of town! I almost lost my arm when I stuck it deep between two rocks to reach the shell and the sea just ripped me around like a plastic bag in the wind. It turned out that this was the only *Cypraea* we found among the four of us during this trip.

With a wide grin pulling on my cold blue lips, I exited the water some time later. In my bottle some real nice finds! *Conus cloveri* (soarsi?), *Conus ambiguus*, *Pinna rudis*, *Cymbium marmoratus*, beautifully coloured *Begonia senegalensis* (Carditidae), and *Haliotis tuberculata*. There were a lot of more common, larger species to be found, like *Hexaplex duplex* and large *Thais*, but I wanted to keep space for all the other smaller, rarer shells to be found. Besides, these large shells are hardly ever in a good condition and I'm loath to take shells from the sea if I cannot use them in my collection. I firmly believe in the principle of taking only that which you can use. My grin would have been considerably smaller had I known that due to conditions and circumstances, this would be the one and only dive that I would have here in Senegal.



A spectacular sight: Ile des Sarpani (Serpents).
Photo by Gene Everson.

That evening we went on one of the lovely little brightly-coloured taxi canoes to N'Gor Island for dinner at a quaint Italian restaurant, where we wolfed down the delicious fare like really starved divers. After all, this was my first food in this place and finding shells is a hungry hobby. It was here that Jean-Jacques informed us of some of the social and cultural habits and expectancies of the people of Senegal: some harsh truths about hygienic habits, or rather, lack thereof. One has to remember that this is a harsh, dry, desert type land. Water is scarce, and homes with bathrooms are a rarity, especially in the areas that we would be moving in—that is, coastal, mainly with fishing communities around. Seriously sobered by visions of airborne, waterborne, handborne and whatever-else borne germs and viruses, we returned to N'Gor, already planning in the water-taxi to go to N'Gor Island the next day, to scout around for intertidal shells.

The tide was not properly low when we started looking on the island the next day, but we got a fair idea of which species live in this zone. We found mostly littoral species: *Littorina angulifera*, *Nerita senegalensis*, *Patella intermedia* and *P. safiana*, *Cantharus assimilis* and *C. viveratus*, *Fissurella coarctica* and littlies like *Planaxis lineatus* (?), *Triphora perversa*, *Chauvetia soni*, *Pyrene cribraria* and *Columbella rustica* and *Pyrene rac*.

Coming back from the island we were met by an awful smell. Sylvain explained to us about "le Tebaski" and the accompanying odor. Around the time that we celebrate Easter weekend, the Muslims (92% of the population) celebrate "le Tebaski" festival. Only the best lamb, without any flaws, is sacrificed at the mosque, in memory of Abram. The head of the family then has to share this lamb amongst all dependants and neighbors. It is a very important day on the religious calendar. So many mysteries became clear to me once all this was explained. It certainly explained all the vegetables taken on the flight to Dakar and of course the half-lamb-in-a-butcher-bag (someone was cheating!). Don't forget that the sacrificial lamb has to be clean too,

thus the comic washing of the sheep in the sea. The people were cleaning out the gut and other innards of the sacrificed sheep on the beach. That explained the bad smell, and we were convinced that the place would be covered in flies the next day. We were also speculating about snorkeling in that bay that night, to see if some carnivorous mollusks (*Bullia*, *Natica* and such) also get to celebrate "le Tebaski." It was a unanimous decision not to snorkel in these densely populated bays, especially not after we'd seen what went into that water!

That afternoon I was very privileged to meet Marcel Pin. I believe that he played a large part in putting Senegalese shells "on the map." Unfortunately, Marcel was a very sick man, suffering from emphysema. Conversation was hard. Between gasps of air and very broken French-English we established a common bond...the love of beautiful shells. I wish I could have known him under better circumstances. He gave us much assistance in our quest, especially by "lending" Sylvain to us. We would have been lost without their arrangements and communication skills. We are very grateful to Marcel and Sylvain!

From Belair Bay we could see Goree Island winking at us. This was so exciting! Who would ever have thought that a locality I had seen so many times before on shell labels, would be right in front of my eyes like this. Of course there was hardly any time for unpacking once we arrived because we were going to dredge as soon as possible. What an incredible experience our first dredge was! Another beautifully painted boat, called *Ababacar*, one engine, one triangular dredge, two buckets and four sieves.. The boat was large enough to fit the four of us plus Sylvain and the boat owner, Abdulai, and his friend who helps to haul the dredge in. I have never found so many shells in one day as we found in those four hours—the most lucrative day in my shelling "career." Every time we pulled the dredge up there were, at the very least, five shells in it. By the time we got back to the hotel we were tired, sunburnt, hungry and thirsty; but boy, you've never seen smiles that size on four weary faces before!



Marcel Pin and his wife, Marie-Louise. Photo by Gene Everson.

It is here that the "pick-out" ceremony was founded. Before there was even a thought of a nice cold bath (cold was mostly the only option) all the shells were put out on a table in various family groups. Each person then drew a number and shells got "picked" in numerical order. (The shells that remain "unpicked" are returned to the bucket of water and taken back to sea.)

Well, I have never seen such concentration on those two men's faces before! Each time it was the "opponent's" turn to pick, the other would try to distract his attention by pointing to interesting shells in the hopes that the "opponent" would not pick the shell he wanted. All this haggling became like a serious Wimbledon match and there were times that I howled with laughter. I never thought that conchologists could be more fun to be with than the actual shells! Only after the "ceremony" did we hear each other's stomachs growling. Time to eat! That

night we worked together until very late to identify and process all those shells.

The next day we discovered that Homer and Ann had very little sleep. There were some geese and a goat in a pen right behind their room and the accompanying sounds and smells became too much for these seasoned travellers to bear. Anne took time out from the dredging, because she was also experiencing early symptoms of "travellers' disease." The rest of us got going early and spent another four hours dredging. We never found the volume and variety again in this and following dredges as we had the first day, but we were very happy with what we found in the rich waters around Goree Island. We discovered the habitat of numerous brightly colored *Pecten flabellum*. Gene coaxed the boatsman to try another area, somewhat shallower and away from the normal area. At first the dredgers wanted to throw away the algae and slimy "seahares" that filled up their dredge, but we said that they must fill up our sieves with the stuff so we could check through it; and lo and behold, one after another pecten was found attached to this coarse algae.



Canoe taxi: N'gor to N'gor Island, Senegal.
Photo by Gene Everson.

The last day at Goree was spent doing "real tourist stuff." This used to be the place where captured slaves were "stored" until they were shipped to far away places. It is just another one of the many atrocities from our "human" past that one would rather forget. Even though an eerie feeling followed me around, it was still a colourful place to see and, of course, one has to learn from the past. In the afternoon we went to visit Marcel, who was by now in hospital in serious condition. That night none of us slept well. At nearly midnight, the locals decided to throw a noisy party at the hotel which lasted most of the night. So between goats, geese and locals, Belair became the place remembered for little sleep and lots of shells. At least, because sleep was impossible, we got most of the identifying done and the shells and clothes were ready and packed for Pointe Sarene, our next venue.

It was at this point that things started to go wrong. Overnight Gene got pretty sick with "traveller's disease." We could only think that he had tea at breakfast that must have been made with local and not bottled water and that he picked up some vicious bacteria. He never really recovered completely for the rest of the trip. This put a serious damper on the moods of everyone. We were constantly worried about him and it just wasn't as much fun, without his funny quips and joking around.

And yet, Pointe Sarene was a lovely little village. Attractive, friendly people and so much cleaner than the places we'd been to before. It is very remote, with hardly any modern amenities: a fresh place to stay if you want to get away from it all. A new dredging canoe was ready and after Gene assured us he would be better off lying

down, we put to sea again. Another bit of bad luck struck when the engine broke down, miles away from land. There we sat for three hours until some good Samaritan fisherman took pity on us and, only after his morning's work, towed us home. It was such a welcoming sight to see the boys rushing from the village into the sea and swimming toward us, laughing and chattering. I couldn't believe it, but Joseph, the headman of the village (and longstanding friend of Marcel) and a lot of his family members and villagers were worried about us and were waiting anxiously on the beach upon our return. What beautiful, hospitable people these are!

Homer and I decided not to be put off by this incident and after we delivered Anne safely to the "nest," we set off again. This time we were in better luck and found the stuff I'd been waiting for this whole trip...marginellas...one of my favourite families. Although we did not find many shells, we felt better for trying. When we finally returned to the huts, the "picking" ceremony took place fairly quietly; only Gene's hiccupping interrupting the softness of the African sunset. Joseph's daughters prepared a delicious dinner of fresh fish and fine rice, which we ate at the communal dining room by the light of a stormlamp, missing Gene, who still could not face any food.

After another day of dredging and not finding too much, we decided to do something different, something that would include the whole group. We chose to go to the mouth of the Joal River about 40km. south of Pointe Sarene, looking for estuarine shells. We found only *Tympanotomus radula* (Potamididae). There was no sign of the marginellas mentioned by Lipe in his book. While we were looking at stalls selling volutes and murex and other items dredged from the sea, the sky started turning a strange colour, as though a yellow light was shining through thin paper. On our way back to Pointe Sarene a real desert sandstorm was born. It transformed the dry arid countryside into a dark brown-grey cloud. It was difficult to distinguish shapes and colours. Everywhere people were taking cover, long robes flapping in the wind, faces covered by headgear. The dust penetrates everywhere.



The author on another shelling expedition (at Simonstown near Capetown, S. Africa.): "The water is real cold!"
Photo by Vincent Jearey.

Bravely, Homer and I still tried to find some intertidal shells that afternoon, at a small rocky outcrop at the point of Pointe Sarene. Amazingly enough, we actually did find some shells. With our heads, faces and bodies covered as well as possible against the beating sand, we must have been quite a sight, bending low and peering intensely, to try and see something under rocks, beyond water ripples. This put an end to the expression, "mad dogs and Englishmen"; rather, "crazy shell-collectors" will be the topic of many a villager's folklore in time to come. We found a larger type of *Nerita clavatula coerula*, small *Conus pulcher*, *Epitonium commutata* and *Conus guinaicus* (one of these was very large, measuring 53mm.). Under the rocks there were

also hundreds of *Turritella bicingulata* lying close together under the rocks; maybe they were also hiding away from the dust and sand.

Until the sandstorm subsided there would be no dredging, and at this point it looked like it was there to stay for quite a while. Gene was also getting weaker and, since there were no medical facilities in Pointe Sarene, we decided to return to Dakar the following day. All the way back home the following morning, the group quietly watched the sandstorm following us. Baobab and thorn trees were exposed to the force of the wind. Upon arrival at Dakar we booked into a hotel and took Gene to a clinic, where he received medication via intravenous drip. Feeling a little more at ease now that something was being done about his condition, we slept a little better that night. He didn't. He was still hiccuping!

Our last two days were spent doing some more work on the shells and packing them carefully, then going to various markets. Sylvain took us to Soumbédioune, a large village type market where beautifully handcrafted items can be bought. I know I drove Sylvain nuts trying to decide what to buy; he certainly learned about patience during this day. Buying an item in Senegal was not the uncomplicated transaction we all knew at home. The stall owner quoted an unbelievably high price and would be very insulted if you didn't quibble or bargain about the price. Once you had left with your purchase, you still had that uncanny feeling that you've just been played by an expert, and yet you were happy that you'd acquired something unique.

Friday 17 April: after spending a lot of time and money at the market we decided to have a nice big lunch with Sylvain at the Brazzerade. During lunch Sylvain was called to the phone to be told that Marcel Pin had passed away. Marcel was like a father to Sylvain. What a sorry day for all of us! What a sorry day for conchology in Senegal! It was at this point that I started to take a really great liking to red wine. That night Homer, Anne and I had that as the main and only course for dinner. Gene was still hiccuping.

SPECIES DREDGED OFF GOREE ISLAND AND POINTE SARENE

(26 species still unidentified)

Gastropoda:

Turritella bicingulata Lamarck, 1822
Aporrhais senegalensis Gray, 1838
Strombus latus Gmelin, 1791
Trivia candidula(?) Nickles, 1950
Natica fanel (Röding, 1798)
Cymatium gibbosum kobelti (von Maltzan, 1884)
Cymatium trigonum (Gmelin, 1791)
Eglisia spirata (Sowerby, 1825)
Attiliosa goreensis Houart, 1993
Purpurellus gambiensis (Reeve, 1845)
Favartia emersoni Radwin & D'Attilio, 1976
Ocenebra flavida (Jousseaume, 1874)
Ocenebra inermicostata E. Vokes, 1964
Jaton decussatus (Gmelin, 1791)
Typhis sowerbyi (Broderip, 1833)
Nassa miga (Bruguière, 1789)
Cyllene lamarcki Cernohorsky, 1975 (was *lyrata* Lamarck)
Bullia miran Bosc, 1801
Fusinus boettgeri (von Maltzan, 1884)
Latirus armatus A. Adams, 1854
Latirus filiosus (Schubert & Wagner, 1829)
Afer afer (Gmelin, 1791)
Cymbium pepo (Lightfoot, 1786)
Olivancillaria hiatala (Gmelin, 1791)

Olivella pulchella (Duclos, 1835)
Agaronia acuminata Duclos, 1835
Marginella arenaria (?) Mörch, 1852 (is *denticulata* Link, 1807?)
Marginella bifasciata Lamarck, 1822
Marginella denticulata Link, 1807
Marginella aurantia Lamarck, 1822
Marginella cincta Kiener, 1834
Marginella harpaeformis Sowerby, 1846
Persicula avellana (Lamarck, 1822)
Persicula cornea Lamarck, 1822
Persicula persicula (Linné, 1758)
Prunum amygdalum (Kiener, 1841)
Mitra hebes Reeve, 1845
Cancellaria cancellata (Linné, 1767)
Conus pulcher Lightfoot, 1786
Drillia patriciae Bernard, 1984
Clavatula bimarginata (Lamarck, 1822)
Clavatula coerulea Weinkauff, 1880
Clavatula rubrifasciata (Reeve, 1845)
Clavatula sacerdos Reeve, 1845
Crassispira callosa (Kiener, 1839-40)
Crassispira consociata (E.A. Smith, 1877)
Fusiturris undatiruga (Bivona, 1832)
Genota mitraeformis (Wood, 1828)
Perona nifat (Bruguière, 1789)
Hastula lepida (Hinds, 1844)
Terebra dillwynii Deshayes, 1859 (syn: *concinna* Deshayes, 1859)
Terebra senegalensis Lamarck, 1822
Dentalium senegalense Dautzenberg, 1891

Jean-Jacques took pity on this sorry group on our last day and took us to Point Almadies. It is the westernmost point of Africa. With the Dakar golf course behind me, I climbed on a huge rock and just drank in this spectacular beauty. The sea blue-green, white waves bashing away at the rockwalls, clear skies, the setting sun shimmering on the water. You could see forever from there! Jean-Jacques said, "You are now standing on 'The Nose of Africa.'"

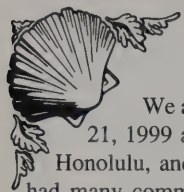
When Sylvain and I dropped Gene, Anne and Homer at the airport the next morning; they were quite ready to leave. Who could blame them? Would we ever see each other again, separated by a massive ocean, living on different continents? A light of smiles went up as we realized that our hobby would keep us together in a way. When we look at the lovely shells we found here, we will remember and think of each other. And contact is just as far away as the nearest postbox; that's how we got to know each other in the first place! So...goodbye! Gene is still hiccuping!

I had to wait til evening before my plane left and Sylvain very kindly walked around with me. I wanted to see, hear and smell some more. We crossed the bay again to have a last glass of red wine at Mama's Italian Restaurant on N'Gor Island and to reminisce about Marcel and other happenings. Back on the beach in front of the Brazzerade Hotel, I stroked the head of one of the surviving sheep, strutting around on the sand. I wished him a slight flaw before next year's "Tebaski" celebrations; maybe that way he would survive another year! So this is Senegal! You have beautiful and graceful people and stunning shells, I would like to come back sometime and have more luck in my traveller's bag. There is so much potential here. As we flew out that night I could see "The Nose of Africa" clearly etched where the flickering city lights hugged the dark sea.

P.S. For those who would like to know, as soon as Gene returned home, he visited his physician who gave him the correct medication. A few hours later he stopped hiccuping!

Bivalvia:

Arca arca Linné, 1758
Arca noae Linné, 1758
Glycymeris vovan Lamy, 1906-23
Modiolus lulat Dautzenberg, 1891
Anomia ehippium (Linné, 1758)
Phacoides adansoni (d'Orbigny, 1839)
Loripes lacteus (Linné, 1758)
Montacuta bidentata (Montagu, 1803)
Cardita ajar Bruguière, 1792
Cardita tankervillei (Wood, 1828)
Chama crenulata (Lamarck, 1819)
Pseudochama gryphina (Lamarck, 1819)
Eucrassatella triquetra (Reeve, 1842)
Eucrassatella paeteli (von Maltzan, 1885)
Cerastoderma edule (Linné, 1758)
Cardium norvegicum Spengler, 1799
Cardium papillosum (Poli, 1795)
Ringicardium ringens (Bruguière, 1789)
Vepricardium serrulatum (Deshayes, 1855)
Tellina hyalina Gmelin, 1791
Donax oweni Hanley, 1844
Circumphalus foliaceolamellosus (Dillwyn, 1817)
Venus rosalina Rang, 1834
Pitar floridella (Gray, 1838)
Venerupis dura (Gmelin, 1791)
Dosinia exoleta (Linné, 1758)
Corbula sulcata Lamarck, 1801



Dr. C.M. Burgess

We all mourn the death of Dr. C.M. Burgess, on January 21, 1999 at the age of 91. He was a friend to many of us in Honolulu, and to *Cypraea* collectors worldwide, with whom he had many communications and visits. To most people, he is best known for two books that he authored, *The Living Cowries*, 1970 and Burgess' *Cowries of the World*, 1985.

To his friends he was known as "Pat." Born near Devil's Lake, North Dakota, Pat was educated at the University of North Dakota and Northwestern University where he received his M.D. degree in 1933. He was a practicing surgeon until recent years, and well known in that field. He was an active member of the Hawaiian Malacological Society since its inception in 1941. Many were the thoughtful articles he contributed to the *Hawaiian Shell News*, which he held in high regard. Throughout the years, he specialized in *Cypraeidae*, but was

interested in a number of other families.

In the 1950's Pat went diving with several of the HMS people at Makua when it came to his attention that the source of several *Cypraea* species had been found, species that were previously rare to local shell collectors. What a pleasure it was for me to be in on Pat's first live *Cypraea tessellata*. This was the start of a long relationship between us, and about the start of his specialization in *Cypraea*. His study involved a tremendous amount of research in all the known lit-



erature and continued almost to his death. Much information was gathered from amateur collectors with whom he exchanged letters, and shells. Dr. E. Alison Kay and other malacology professionals were also quite influential in his research.

His first book on cowries was the product of many years of effort, and was widely acclaimed and, for years, the foremost book on *Cypraea*. In the book, Pat indicated a growing interest in the examination of *Cypraea* animals. During the 15 years between his two books, he placed emphasis on learning as much as possible of these animals. People from all parts of the world contributed live animal photos. Even after the completion of his second book which emphasized the *Cypraea* animals, Pat continued this research vigorously. His wife Grace was very involved in producing both books.

Pat was a great hunter and fisherman as well as being an authority on *Cypraeidae*. He enjoyed trips to Iceland for these activities for a number of years. Pat was an expert craftsman and machinist and produced his own rifles. He made many craft articles in his home shop, and was generous in giving them to visitors. He was also especially generous in allowing the HMS to generate scholarship funds by sale of many of the books he was given by the publisher in payment for his authorship.

Pat Burgess had a very extensive and impressive *Cypraea* collection, one of the most complete in the world, including at least 90% of the mollusks found in Hawaii and many voucher specimens. Pat desired these collections to remain in Hawaii, available to malacologists. Therefore, he willed them to the Bishop Museum in Honolulu and specified that Dr. E. Alison Kay oversee the donation. Additionally, the family have requested that donations in Dr. Burgess' memory be made to the Bishop Museum Malacological Research Fund.

Pat Burgess is survived by his wife, Grace, and two daughters, Mary Ann Dacey and Patricia Blackman. A memorial service held on January 23 was limited to immediate family, at Pat's request.

There will be other authors of books on *Cypraea*, but none will replace Pat in our memories, and this is especially true of those who have been editors of the *Hawaiian Shell News* in all its forms.

—Wes Thorsson

A Most Fortunate Destiny

by Andrew K. Rindsberg

"It is perhaps a more fortunate destiny to have a taste for collecting shells than to be born a millionaire." —Robert Louis Stevenson

Then again, it may be the most fortunate destiny of all to be a shell-collecting millionaire, like Truman H. Aldrich (1848-1932).

Aldrich was born in upstate New York and early acquired a taste for collecting freshwater shells. At the age of 23, he moved to Alabama after the Civil War to start a bank, and later opened the state's first underground coalmine and made quite a lot of money. State Geologist Eugene Allen Smith persuaded him to take up the study of Tertiary mollusks, which were sorely in need of attention. Aldrich must have spent many happy evenings sorting shells; there was no television then. He not only visited outcrops, but paid others (including Daniel Webster Langdon) to collect for him, and built up one of the world's largest collections of modern shells by trading and buying: an estimated 20,000 to 30,000 species. For a while, he also represented Birmingham, Alabama in Congress, one of the few paleontologists ever to grace those hallowed halls. Even more remarkably, he was elected on the Republican ticket.

Through what his eulogist called a "quixotic sense of honor," Aldrich lost his fortune, but continued his work on paleontology, writing one or two brief papers per year and eventually joining the

Alabama Museum of Natural History as Curator of Paleontology. If a man's inner life can be read in his face, then photos show that he was content.

While he was still very much alive and active, Aldrich donated some of his shells and shell books to the Johns Hopkins University and some to the Geological Survey of Alabama/Alabama Museum of Natural History. The modern shells are now at the Florida Museum of Natural History, and the Johns Hopkins shells are now at the Smithsonian, but his name is still on all the labels and bookplates, and it is honored.

I suppose that money allowed Aldrich the leisure time to do as he pleased with his shells, and to amass a really large collection of them, not to mention books, which have always been expensive. But I've read D. W. Langdon's field notes, and they impart a sense of wonder and discovery that Aldrich could have experienced only through the microscope. Langdon was sent to canoe down the Chattahoochee River and discovered a major Miocene site, Alum Bluff, just south of the Florida border. Langdon liked to whistle as he worked. He must have whistled that day.

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WILL THE REAL *CHICOREUS* (*PHYLLONOTUS*) *GLOBOSUS* PLEASE STAND UP

By J. M. Inchaustegui

Photos by the author

In early June of last year a group of 19 shellers, accompanied by Dr. Emilio Garcia and Dr. Emily Vokes, the world known Muricidae expert, met in Miami for the start of a 13 day shelling trip to Venezuela, South America, the home of *Cypraea mus* (Linné, 1758) and *Voluta musica* (Linné, 1758). After a non-eventful flight to Caracas we prepared for a night anticipating our early departure next morning. We flew to Punto Fijo, in the Paraguana Peninsula, Venezuela's westernmost State. This region is semidesert and has many cactus varieties which were booming in lovely shades of yellows and in white.



Amuay Bay, Paraguana, Venezuela: the flats at low tide with turtle grass just offshore.

Early that afternoon we met our drivers of the two vans that were to become almost home for the next few days. These drivers are descendants of the Carib Indians and know the area thoroughly. Before Columbus came to America the Carib Indians spread from South America through the islands off the coast until they had populated all of these islands as far north as Hispaniola and Cuba and most of the Bahama Islands. They were more aggressive than the more peace-loving Taino Indians who had arrived at these islands earlier through the same route, and so displaced them. From the Caribs, we get such words as "Caribbean" and "Hura-Kan," the Carib god of Malevolent Winds and Destruction.

My father and grandfather were poets and historians who wrote many university text books about the history and geography of this area and these people. One book that comes to mind is the 2 volume history written by my father in Spanish in 1853, titled, *The Great English Expedition Against the Greater Antilles*. In it he recounts that the Spanish Conquistadores in Hispaniola would punish the Caribs who would not work in the gold mines by setting loose their mastiffs to tear the poor fellows to pieces. In retaliation, when the Caribs captured a Spanish soldier, they would tie him spread-eagled to four stakes in the ground. They would heat a clay bowl red hot and place a jungle rat that had been starved for days on the prisoner's stomach and cover the rat with the hot bowl. The heat would cause the rat, in an effort to get away, to cause prolonged and unimaginable torture. But that is a story for another audience.

We drove up the west coast of the peninsula heading north to a little fishing village right on the beach. Here we collected some Venus clams and other beached shells, but the wind that blew constantly at 30 to 40 mph kept the water all churned up and cloudy with sediment so that it was impossible to snorkel. I asked one of the drivers when this wind would let up and he assured me that it would be windy until the

end of July! We spoke to some of the fishermen to ask if they had any shells for sale, but to no avail. In the yard behind the shack I found a large *Tonna galea* (Linné, 1758) that had just recently been the fisherman's meal and still had a distinctive aroma. However, a good cleaning back at the Hotel removed all of this and it turned out to be quite a nice shell.

On our way back south we stopped at a couple of likely looking beaches but there was too much silt to snorkel so we walked the beach doing the "Sanibel Stoop." We shortly came upon some discarded shells which had been boiled and the meat removed. However, the internal organs were still in the spire and they were decomposing and smelled terribly. The fly maggots were having a picnic. There were mostly *Strombus pugilis* in several color varieties and, to top it off, the opercula were discarded right next to the shells. Among all the *Strombus* I was lucky to find two Calico Clams, *Macrocallista maculata* (Linné, 1758). The larger of the two was about four inches.

After driving back towards the Hotel, we turned down a dirt road leading to Amuay Bay where we hoped to find some *Cypraea mus* in the sea grass. Some small children had *C. mus* in a plastic container and I asked one of them how he had collected them in that muddy water. He said they would walk barefooted over the sea grass in shallow water until they felt something hard and they would then reach down and pick up the cowries. I said to myself, this is easy, and proceeded to walk through the grass with my reef shoes, and, sure enough, I stepped on something hard, so I stooped over and reached for my prize. What a surprise when the crab I was holding down with my foot clamped onto my finger. Well, I had bought enough of those shells from the kids anyway!



The author in "clover" on the beach at Amuay Bay.

At a fisherman's hut we bought a few *Conus*, cowries, and some very nice spindle shells. After buying almost his entire stock at a very reasonable price, we went a few yards down the beach and to our amazement saw a pile of shells two or three feet deep, about ten feet wide and about forty feet long, composed of thousands of shells, mostly *Chicoreus* (*Phyllonotus*) *globosus* Emmons, 1858 and Cross-barred Venus clams. But by digging into the pile, we found some other very nice shells, shells like *Melongena melongena* (Linné, 1758) and *Voluta musica*. Concerning the taxonomy of that vast pile of murex, I must tell you I consider myself a "lumper," not a "splitter," so I refer you for the technical stuff to Dr. Emily Vokes' very enlightening article in the *American Conchologist* (Vol. 26, No. 3, p. 4-6, September 1998). She explains to you that these are really *Chicoreus* (*Phyllonotus*) *margaritensis* (Abbott, 1958). After you have read it thoroughly, can you explain it to me? These questions almost make me want to go back to collecting postage stamps!

I filled my goodie bag with some (many) of these smelly shells and we returned to the hotel with all our treasures, tired but happy. I was wet, smelled worse than a boiled crab, and had sand in my shorts, so I got the shower ready. After stripping down to nothing, I was almost in the shower when the telephone rang. It was the receptionist wanting to know if I would interpret for her what was wanted by one of our group who could not speak Spanish. She made a three-way connection and I translated for her; they needed some clean towels. So back to the shower when the phone rang again. Another translation, *por favor?* This time another sheller wanted toilet paper...but not to wrap shells with! I was almost running to the shower when the phone rang again. Caramba! Room 315 had a toilet that wouldn't flush. I had to leave the phone off the hook so I could take my shower in time for happy hour.

The next day we had a very nice breakfast: eggs, fried green plantains, refried beans and "arepa," a very tasty fried corn grits which, when flavored with butter or guava jelly, tasted better than corn bread. On the menu they showed "Chivo" for tonight. I had not had "Chivo" (young goat, usually fried over charcoal or barbecued on a spit) for many years and was looking forward to it. Both Dr. Vokes and I placed our order with the maitre'd for that night. But back to the shell quest.

Next morning we got into the vans and drove to the east coast, then north to Piedras Negras. Here was a shallow reef just offshore and water calm enough to snorkel. Ten feet from shore, amongst the turtle grass, I found my first *Voluta musica* in less than a foot of water. A good start. A little further there were rocks leading down into deeper water with some coral slabs. I turned the slabs to examine them, being careful to put them back just as I found them to protect the small sessile organisms that lived underneath from hungry fishes and the killing effects of the sun and wind. In a crevice I found a very large *Cittarium pica* (Linné, 1758) with a 3.5" base. Then under some rock slabs I found some snails that looked about the size and color of small raisins which I put into a little vial for later examination. To my surprise, after consulting with Dr. Garcia and Dr. Vokes, and much discussion between them (I could hear such comments as "Yes, but count the denticles," "Does it have plicae on the columella?" "The anterior canal on this one is too large," and "How many spiral threads does that one have?") I found out that these little snails were *Risomurex gilberthar-risi* (Weisbord, 1962) with a few *Trachypollia nodulosa* (C.B. Adams,

1845) mixed in. To me they looked so much like each other that I am still unsure which is which!

Back at the hotel we asked for our "Chivo;" the reply was, "No tenemos Chivo esta noche. Manana si." We asked every night and got the same answer, and we had to leave Punto Fijo without tasting it!

One afternoon we stopped at Punta de Barco and examined the reef where small boys were collecting buckets full of *Astraea phoebia** Röding, 1798 to sell to the local restaurant. One boy must have had over 300 in his 5-gallon bucket, but I couldn't find one on the reef! After seeing the thousands of murex, cowries, strombus and clam shells in those refuse piles, I wondered why shell collectors are blamed for over collecting and causing damage to the ecosystem.

The attached list of shells was compiled from the shells I collected plus those of Cecil Bankston of Baton Rouge, L.A. and A.B. Osborne of Elizabeth, LA who allowed me to see their shells and actually gave me some of their material.

*This *Astraea* species is classified as a restricted species by the Florida Marine Fisheries Commission.



A closer look at the shell pile. Just reach out and collect some murex!

Species found on Venezuela trip:

Chitons

Chiton tuberculatus Linné, 1758

Gastropods

Nerita tessellata Gmelin, 1791
Smaragdia viridis (Linné, 1758)
Hemitoma octoradiata (Gmelin, 1791)
Fissurella nimbosa (Linné, 1758)
Tegula fasciata (Born, 1778)
Cittarium pica (Linné, 1758)
Astraea brevispina Lamarck, 1822
Astraea caelata (Gmelin, 1791)
Astraea phoebia Röding, 1798
Planaxis lineatus (da Costa, 1778)
Planaxis nucleus Bruguière, 1789
Cerithium lutosum Menke, 1828
Batillaria minima (Gmelin, 1791)
Turritella variegata (Linné, 1758)
Strombus pugilis Linné, 1758
Strombus pugilis Linné, 1758 forma worki?
Crepidula aculeata (Gmelin, 1791)
Crepidula convexa Say, 1822
Crepidula glauca Say, 1822
Cypraea mus Linné, 1758
Cypraea mus donmoorei Petuch, 1979
Polinices hepaticus (Röding, 1798)
Natica canrena Linné, 1758
Tonna galea (Linné, 1758)
Tonna maculosa (Dillwyn, 1817)

Phalium granulatum (Born, 1778)
Cymatium parthenopeum (Von Salis, 1793)
Distorsio clathrata (Lamarck, 1816)
Murex chrysostoma Sowerby, 1834
Murex messorius Sowerby, 1841
Murex (Phyllonotus) globosus (Emmons, 1858)
Chicoreus brevifrons (Lamarck, 1822)
Muriopsis (Risomurex) gilberthar-risi (Weisbord, 1962)
Trachypollia nodulosa (C.B. Adams, 1845)
Thais deltoidea (Lamarck, 1822)
Thais haemostoma floridana (Conrad, 1837)
Thais rustica (Lamarck, 1822)
Pisania auritula (Link, 1807)
Columbella mercatoria (Linné, 1758)
Nitidella laevigata (Linné, 1758)
Nitidella ocellata Gmelin, 1791
Anachis lafresnayi (Fischer & Bernardi, 1856)
Nassarius cinisculus (Reeve, 1853)
Fasciolaria tulipa (Linné, 1758)
Fusinus couei (Petit, 1853)
Leucozonia nassa (Gmelin, 1791)
Lecuoazonia ocellata (Gmelin, 1791)
Melongenella melongenella (Linné, 1758)
Voluta musica Linné, 1758
Voluta musica guinaica Lamarck, 1811
Vasum muricatum (Born, 1778)
Oliva sayana Ravenel, 1834
Olivella minuta Link, 1807
Ancilla glabrata (Linné, 1758)
Marginella interruptolineata Mühlfield, 1816

Marginella prunum (Gmelin, 1791)
Conus atractus austini Rehder & Abbott, 1951
Conus spurius arubaensis Usticke, 1968
Bulla occidentalis A. Adams, 1850
Bulla striata Bruguière, 1792
Melampus monile Bruguière, 1789
Siphonaria pectinata (Linné, 1758)
 Land snail sp.

Bivalves

Arca zebra (Swainson, 1833)
Anadara notabilis (Röding, 1798)
Modiolus americanus (Leach, 1815)
Pteria colymbus (Röding, 1798)
Pinctada imbricata Röding, 1798
Ostrea equestris Say, 1834
Pecten ziczac (Linné, 1758)
Lucina pectinata (Gmelin, 1791)
Ctena orbiculata (Montagu, 1808)
Codakia orbicularis (Linné, 1758)
Trachycardium egmontianum (Shuttleworth, 1856)
Trachycardium isocardia (Linné, 1758)
Trachycardium muricatum (Linné, 1758)
Laevicardium laevigatum Linné, 1758
Donax denticulatus Linné, 1758
Chione cancellata (Linné, 1758)
Tivela mactroides Born, 1778
Pitar albida Gmelin, 1791
Callista eucymata (Dall, 1890)
Macrocallista maculata (Linné, 1758)

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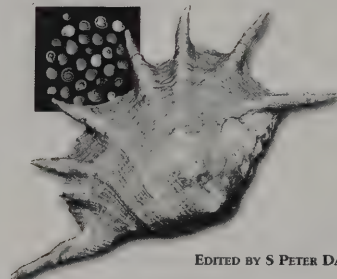
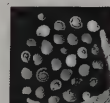
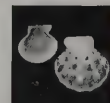
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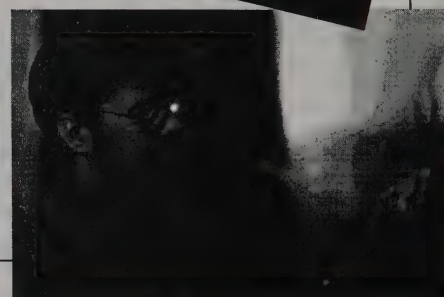
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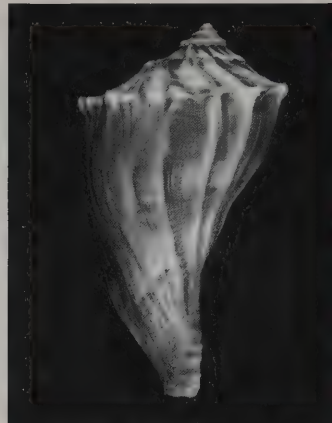
WESTERN ATLANTIC BUSYCON

by Kevan and Linda Sunderland and Mark Johnson

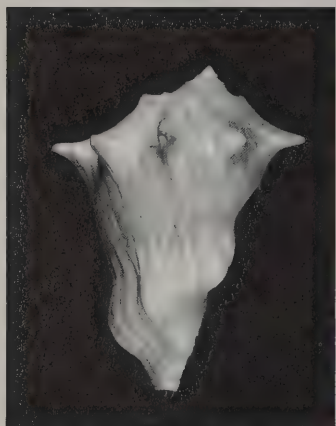
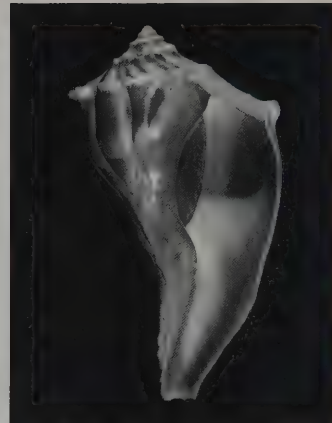
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Busycon candelabrum (Lamarck, 1816). 65 mm. 200 feet, by shrimp, off Yucatan, Mexico.



Busycon carica (Gmelin, 1791). 168 mm. Shallow water sand flats, Wrightsville Beach, N.C.



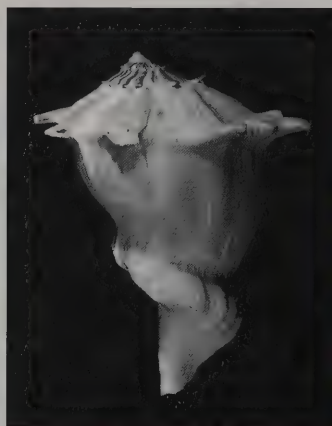
Busycon carica forma *eliceans* Montfort, 1810. 167 mm. Intertidal flats, Foley Island, S.C.



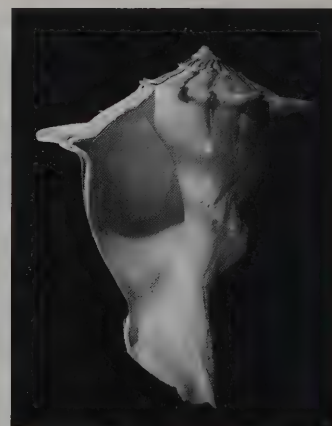
Busycon coarctatum (Sowerby I, 1825). 163 mm. 250', by shrimp, off Contoy Light, Mexico.



Busycon lyonsi Petuch, 1987. 115 mm. 130 meters, in fish trap, 70 miles due west of Clearwater, FL.



Busycon perversum (Linné, 1758). 198 mm. 150', by shrimp, off Yucatan, Mexico.



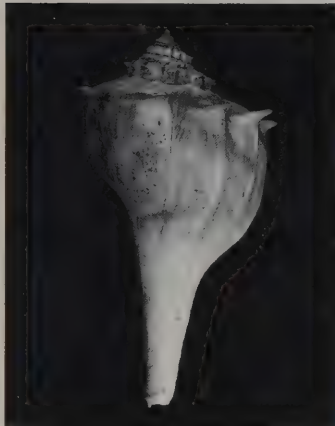
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gopher://erato.acnatsci.org:70/11/.wasp. Queried on 1/20/99.

The intent of this feature is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



Busycon pulleyi Hollister, 1958. 190 mm. 20 fathoms, by shrimper, Campeche Banks, Gulf of Mexico.



Busycon sinistrum Hollister, 1958 125 mm. In-shore mud flats, Sanibel Island, FL.*



Busycon canaliculatum (Linné, 1758). 189 mm. Intertidal mud flats, Sanibel Island, FL.



Busycon plagosum (Conrad, 1862). 165 mm. 30', by shrimper, off Brownsville, Texas.



Busycon pyruloides Say, 1822. 146 mm. 80'; dead in stone crab trap off Marco Island, FL. Some workers consider this an offshore subspecies of *B. spiratus*.



Busycon spiratum (Lamarck, 1816). 114 mm. In-shore mud flats, Sanibel Island, FL



* The name for the living species is currently considered to be *B. sinistrum*, while the more familiar name, *B. contrarium*, was applied to a fossil *Busycon*; some authorities consider these two names to be synonymous.

SCUM III: Southern California Unified Malacologists

by Lindsey T. Groves

Forty-three professional, amateur and student malacologists and paleontologists attended the third gathering of Southern California Unified Malacologists (SCUM) at National University, La Jolla, California on Saturday, 16 January, 1999. This informal association is to facilitate contact and keep its members informed of research activities and opportunities. There are no dues, officers, or publications. It is hoped SCUM and other informal groups of this sort will encourage more gatherings of professional and amateur molluscan researchers.

Host of SCUM III, Dr. Hans Bertsch (National University) welcomed the guests and updated everyone on recent happenings. As with previous gatherings, all participants were given an opportunity to briefly present details of their current molluscan research and/or activities (see below). Throughout the presentations numerous discussions and comments resulted from a vast majority of the attendees. Following the presentations Hugh Bradner (Scripps Institution of Oceanography) kindly volunteered to host SCUM IV in January of 2000.

SCUM III attendees and their respective interests and/or activities:

- **Terry Arnold** (San Diego Shell Club): Research on fossil Cypraeidae (especially *Muracypraea*) (with Lindsey Groves), particularly their method of long distance migrations.
- **Hans Bertsch** (National University, San Diego): Panamic nudibranchs; biodiversity survey at Punta Eugenia and Isla Cedros, Baja California, Mexico; and a new species from 3000 ft. off Oregon.
- **Hugh Bradner** (Scripps Inst. Oceanog.): Cypraeid radulae with SEM techniques; follow-up papers to the Bradner & Kay (1996) cowrie radula atlas.
- **Lisa Crummett** (Calif. St. Univ., Fullerton): Intertidal limpets (with Doug Eernisse): should *Lottia digitalis* be separated into *L. digitalis* (Baja Calif to Pt. Conception, CA) and *L. austrodigitalis* (Pt. Conception, CA to Alaska)?
- **George Davis** (Nat. Hist. Mus. L.A. Co.): Recently completed MS thesis on Pliocene invertebrate faunas excavated beneath the Arco Towers in downtown L.A.
- **Tom Demere** (San Diego Mus. Nat. Hist.): Update on expansion plans at the SD Mus. Nat. Hist.; continues work on molluscivore fossil vertebrates.
- **Patricia Don Vito** (San Diego Nat. Hist. Mus.): Micromollusks; computer catalog of museum fossil collection.
- **Doug Eernisse** (Calif. St. Univ., Fullerton): Chiton chapter of revised Light's Manual [Intertidal invertebrates of the central California coast] (with Roger Clark, Klamath, OR); chiton chapter of *Taxonomic atlas of the benthic fauna of the Santa Maria Basin and western Santa Barbara Channel*; phylogenetic and shell microstructure research with CSUF students; research on Ordovician chitons (with John Pojeta, Jr.); developing new invertebrate gene sequencing techniques.
- **Wes Farmer** (San Diego Shell Club): Documentation of Eocene faunas and floras at Torrey Pines State Reserve, La Jolla, CA using web site and CD ROM.
- **Daniel Geiger** (Univ. So. California/Nat. Hist. Mus. L.A. Co.): Dissertation on abalone systematics and phylogeny almost complete; analysis on fossil abalone ready for publication in Journal of Paleontology (with Lindsey Groves); co-author with Jim McLean on phylogenetic analysis of *Fissurepta* gastropods (Family Fissurellidae); Pea Crabs commensal with abalone.
- **Donovan German** (Anaheim, CA): Interest in intertidal mollusks (particularly the evolutionary significance of the 2nd gill in *Lottia gigantea*) and crustaceans.

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• **Lance Gilbertson** (Orange Coast College): Urocoptidae of the arid southwest (AZ, NM, TX, Mex.) and Cuba; Urocoptid reproductive anatomy and systematics.

• **Alan Grant** (Laguna Beach, CA): Video of various gastropods & nudibranchs of southern California, Baja California, & British Columbia.

• **Lindsey T. Groves** (Nat. Hist. Mus. L.A. Co.): Eastern Pacific fossil and eastern Pacific Cypraeacea; early Miocene to Recent cypraeid *Muracypraea* in the Caribbean (with Terry Arnold); survey of fossil abalone for the *Journal of Paleontology* (with Daniel Geiger); companion volume to Keen & Bentson's (1944) *Check list of California Tertiary marine Mollusca* (with Richard Squires and Louella Saul).

• **Carole Hertz** (San Diego Shell Club): Editor, *The Festivus*, (30th year of publication); new species of Panamic *Favartia* (with Barbara Myers); Panamic species of *Fusinus*.

• **Jules Hertz** (San Diego Shell Club): Business Manager, *The Festivus*; assisted Kirstie Kaiser with mollusk checklists of off-shore Panamic islands.

• **Kim Hutsell** (San Diego Shell Club): Second edition of *Registry of World Record Size Shells* will be published in July; preparing book on worldwide Pectinidae (with Bret Raines, Victorville, CA).

• **John Jackson** (San Diego Shell Club): President of Odyssey Publishing Co. (marine sciences) reprinted *Compendium of Seashells* by Abbott & Dance, published Barry Wilson's *Australian Shells*, and new work on cypraeid genus *Zoila* also by B. Wilson.

• **George Kennedy** (San Diego St. Univ.): Pleistocene marine terraces of California; Paleocene mollusks from the Santa Monica Mountains, (with Dick Squires); Pliocene worm tubes from the Niguel Formation (Pliocene) and possible first occurrence of Late Cretaceous mollusk fossils from the Late Cretaceous, Lusardi Fm. from northern San Diego Co.

• **Jim McLean** (Nat. Hist. Mus. L.A. Co.): Book on northeast Pacific shelled gastropods still in progress (1370+ species including over 250 new species, 13 new genera) (also for publication in *The Nautilus*); gastropod chapter for the update of Light's Manual.

• **Chris Meyer** (Univ. Calif., Berkeley/Univ. Guam): Recent cypraeid phylogenetics work demonstrating close relationships to the fossil record and biogeographic trends.

• **Mike Miller** (San Diego Shell Club): Slide presentation of a collecting trip to Indonesia.

• **Scott Rugh** (SD Nat. Hist. Mus.): Curating mollusk collection from San Diego Formation (late Pliocene) from construction sites near Olay, San Diego Co.

• **Louella Saul** (Nat. Hist. Mus. L.A. Co.): Biogeography and paleoclimatic changes of Cretaceous gastropods and bivalves; Miocene invertebrates, Topanga Formation, Santa Monica Mountains, Los Angeles Co. (with Takeo Susuki); fossil argonauts from Miocene strata of southern California (with Carol Stadum).

• **Bill & Nancy Schneider** (San Diego Shell Club): Pleistocene terrace mollusks from Mulege, Baja California Sur, Mexico; documented 200+ species in *The Festivus* (SDSC publication).

• **Roger Seapy** (Calif. St. Univ., Fullerton): Pelagic heteropod mollusks and heteropod chapter for the Light's Manual update (with Carol Lalli). Current President of the WSM.

• **Carol Skoglund** (Phoenix, AZ): Molluscan literature on the Panamic Province for an update of her bibliography on the region.

• **Travis Smith** (UC San Diego): Extinction patterns of Pectinidae in the California Neogene.

• **Richard Squires** (Calif. St. Univ., Northridge): Cretaceous and Paleogene mollusks; updating 1984 monograph on fossils of the Eocene, Lajas Formation, Simi Valley, Ventura Co., CA; correlation chart of west-coast Paleogene formations.

• **Carol Stadum** (Carlsbad, CA): Paleontologic salvage operations, Orange County, CA; fossil argonauts from Miocene strata of southern California (with Louella Saul).

(Continued on bottom of next page.)

The Old Shell Game

by Paul Monfils

On February 21, 1753, following a year of intense promotion, one of the first great international seashell auctions was held at Longford's of London. Collectors and dealers traveled from nations throughout Europe, enticed by a published list of conchological rarities to be sold to the highest bidder. A collector of today, perusing the same list, would not find it particularly exciting. A cowrie collector would not find *Cypraea leucodon*, *exusta*, or *broderipii* listed. These species would not be described until 75 years later. A century and a half would pass before the discovery of *Cypraea armeniaca*, *fultoni*, *hirasei*, *langfordi*, *porteri*, *rosselli*, and many others. No slit shells were offered—they were "known" to be long extinct. Perhaps the rarest and most coveted shell of the era was Lister's conch (*Strombus listeri*); however, that species was not included on the auction agenda, as it was known from only a single specimen, collected 130 years previous. One item which was offered for auction, and which served as a strong incentive for many people to undertake such a long and arduous journey, was a large and perfect specimen of the precious wentletrap (*Epitonium scalare*), which ultimately sold for the modern day equivalent of about five hundred dollars. Today of course, a similar specimen can be readily purchased for one hundredth that amount.

There are many aspects of conchology which contribute to its allure—the intriguing shapes, fascinating patterns and attractive color combinations which characterize the shells themselves; their relationship to distant and exotic locales; the chance to reach out and touch, in some peripheral way, the most mysterious and forbidding of all places, not least, the opportunity to possess that which is unique or rare. Of all these elements, the last mentioned is the least enduring. With proper care, the colors, patterns, and physical form of shells will last for many generations. The more subjective psychological and emotional aspects of collecting will never wane as long as there are those who find satisfaction and pleasure in the intricacies of the natural world. But rarity in marine shells is an attribute that inevitably diminishes over time. With few exceptions, the rare shells of yesterday are the common shells of today.

What exactly do we mean when we say that a shell species is rare? All of us have had some contact with environmental issues. We realize that various species of mammals, birds, and reptiles are considered rare; and some of them have been officially declared endangered, thereby outlawing their collection, sale, exportation and importation. Yet a marine mollusk, even one known from fewer than ten specimens, is never classified as endangered, even though conchologists may consider it extremely rare. There is a simple explanation for this disparity. Typically, before a mammal, bird, or other terrestrial animal is listed as rare, a large percentage of its potential habitat has been thoroughly explored over an extended period of time, and a lack of sightings can then reasonably be interpreted to relate to an actual sparsity of individuals in the area studied. We cannot reliably state that a species is rare in nature unless we have systematically surveyed most of the habitat where it is likely to be found. We know that the next valley will not be overpopulated with giant pandas, nor the next mountain peak cov-

ered with condor nests, only because we have already examined those very peaks and valleys. The same principle holds true for a land snail endemic to a specific island, or a fresh water mussel confined to a particular river system—we can make definitive statements about its relative scarcity, and about changes in its population density over time. But such information cannot be determined for most marine mollusks, particularly those which live in deep water (excluding species which are fished commercially, and which are therefore necessarily abundant).

Only a small fraction of the ocean floor has been explored to date. Such ventures have yielded a bewildering array of organisms, some bizarre, some beautiful, some abundant, and some relatively rare. However, the relative scarcity of a given species in such samples cannot reasonably be taken as an indication of the actual population density in nature, a fact which has been demonstrated repeatedly as formerly "rare" species have been discovered in abundance when a new locality is examined for the first time. Therefore, unlike the classification of a terrestrial species as rare, which indicates that few specimens exist on earth, calling a marine invertebrate rare simply means there are few specimens in collections. One who makes the unwarranted assumption that this implies anything about its overall incidence in nature is likely to be proven wrong. After the first specimen of *Strombus listeri* was discovered, a second specimen did not come to light for another 250 years. At the beginning of this century, only a half dozen specimens were known. In the late 1960's, the species began to appear on the international market, and eager collectors paid hundreds of dollars to obtain one, not realizing that fishermen in Thailand had begun trawling them by the hundreds. Today a nice specimen brings about ten dollars.

Only a few months ago, a Russian trawler working off the coast of Mozambique brought up almost a thousand specimens of Fulton's cowrie (*Cypraea fultoni*), a species which had sold in the previous year for amounts in excess of a thousand dollars. Reports of this event generated cries of indignation and even outrage from some quarters, as the fishermen were lambasted for the wanton destruction of so many individuals of such a rare species, as if a thousand mountain gorillas or snow leopards had been massacred. Such protests overlook the obvious. It is not possible to catch a thousand specimens of a truly rare species. That is what rare means. Rather than the decimation of a scarce animal, this occurrence was a scientific discovery—the revelation that Fulton's cowrie, like so many other "rare" species of the past, is not rare at all, once you know where to look.

R. Tucker Abbott, in his classic 1972 volume, *Kingdom of the Seashell*, declared, "It might well be said that there is no such thing as a rare marine shell, since any species living today must have a large enough population, certainly of several thousands of individuals, to sustain the species." History and science seem to be conjoining to prove him right. In the same work, Dr. Abbott described "perhaps the rarest of all *ex pisce* shells, the DuSavel Cone, *Conus dusaveli*, known from only one specimen coming from a fish caught off Mauritius in 1871..." In the twenty-seven years since the publication of his book, at least several hundred living specimens of this beautiful species have been collected in the Philippines and elsewhere.

It might be advisable not to forge too strong a bond between the current rarity of the specimens we own and the pleasure and satisfaction we derive from them. Otherwise, our collections will inevitably please and satisfy us ever less fully as the years go by, which would sadly undermine the whole purpose of the pursuit.

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- **Kent Trego** (San Diego Shell Club): Analysis of Antarctic mollusk collection at Scripps Institution of Oceanography.
- **Jeff Tupen** (TENNERA Inc.): Marine biologist with interest in fish, invertebrates, & algae; monitoring seawater flow at Diablo Canyon Nuclear Power Plant, San Luis Obispo Co., CA to document mollusk (particularly *Alia carinata*, Family Columbellidae) and other invertebrate populations.

- **Robert Williamson** (Chula Vista, CA): Nudibranch observation trip to Baja California, Mexico.

Also present but not reporting were **Cecilia Williamson** (Chula Vista, CA); **Linda Hutsell**, **Scott Jordan**, **Mike & Karen Mason** and **Bruce Moore** of the San Diego Shell Club, **Kathy Kaholi** of the Pacific Shell Club and **Kaustuv Roy** of UC San Diego.

BOOK REVIEWS

Indo-West Pacific Ranellidae, Bursidae and Personidae (Mollusca: Gastropoda) A monograph of the New Caledonian fauna and revisions of related taxa by Alan G. Beu *Mémoires du Muséum National d'Histoire Naturelle* Vol. 178, *Résultats des Campagnes MUSORSTROM 19* October 1998, 255 p., hard cover, 70 plates, 4 colour plates, 220 x 277 mm, ISBN 2 85653 517 8

A rather daunting title adorns this very new publication, volume 178 of the Memoirs of the French Natural History Museum in Paris, or vol. 19 of the MUSORSTROM project, which describes many aspects of the sea life around the French colony of New Caledonia. Add to this Alan Beu, a New Zealander, who is considered the world's leading expert on Ranellidae, Bursidae and Personidae. The only French you will see in this book is in the Summary.

This is a scientific publication, so it will be of most interest to collectors of these families. Alan describes seventy-three species from more than 1000 collecting stations around New Caledonia, the Loyalty Islands, the Coral Sea and the New Hebrides Archipelago. He re-arranges a few genera, illustrates a lot of type material and describes a few new species. Of course most of the species in the Ranellidae, Bursidae and Personidae have very wide distribution ranges and thus many species described here can be found in the entire Indo-Pacific region, and even beyond.

As a scientific publication, this work describes the species in the finest detail, with information on the whereabouts of type material included. There is a very useful "remarks" section for each species, where comparisons with other species are made, and past taxonomy discussed. Of course a full synonymy is given as well.

Surprisingly for a scientific text, there is no information on the living animal, or the radula. All descriptions are based on shell characters alone. I think this is a pity because many Ranellids have interesting habits and brightly coloured animals. Even if this type of information was considered outside the scope of the book, I feel that there should have been an explanation as to why the omission was made.

Each species is profusely illustrated. There are 70 (!) plates, four of which are in colour; the rest are in black and white, but all are of outstanding quality. The smaller species and protoconchs are illustrated with SEM photographs.

At the end of the book there is a list of references longer than I have ever seen in a work like this. There is also an index, and a list with exact localities of the collecting stations.

The book is in hard cover and looks quite pretty. Some may find the type rather small, but this, too, is typical for scientific publications.

It is not a book for beginners, but collectors of Ranellidae, Personidae and Bursidae, and those interested in the larger shells of the Indo-Pacific region will find this an invaluable publication to add to their library.

—Patty Jansen

Bahrain Seashells by Stephen Green. Photographs by Nazem Chouhfeh. 1994. Arabian Printing and Publishing House, W.L.L. Bahrain. 183 pages. 308 x 217 mm. 165 color plates. Hardcover. \$42 plus \$15 postage and packing.

This is a very beautiful book about the shells of a region that is relatively unfamiliar to most of us. Bahrain is a tiny oil-rich nation of 33 islands situated about midway in the Persian Gulf, and nestled against the eastern Arabian coast, to which it is connected by both causeway and culture. The main island, called Bahrain, was once known as "Paradise Island," and a shelling paradise it certainly is, considering the warm waters and reefs of its many miles of coastline. Archaeological digs show that shells have been a part of the island way of life since the civilization of Dilmun about 4,500 B.C. Today, most families popular with collectors are represented in its fauna.

Bahrain Seashells is, at first glance, a picture book, with 161 species pictured artistically and in full color. Each species should be easily identifiable from the large, clear and colorful photos. Discussion of each species consists of the Family, scientific name, author and date of original description, size, degree of rarity, and a sometimes fanciful description of the shell, calling attention to its most noticeable characteristics. Common locations where they may be collected are given and tiny inset outline maps on each page give a graphic representation of these locations.

The pictured specimens are from the collection of the photographer's wife, Carol Chouhfeh, and are all dead taken shells from the beaches of Bahrain's various coastlines. Gastropod identifications are done by Dr. Robert Moolenbeek of the University of Amsterdam and bivalve identities are confirmed by Dr. P. Graham Oliver of the National Museum of Wales. The book does not include all the species of Bahraini waters, but most of the commoner shells are represented, as well as many rare ones.

Bivalve collectors especially will be attracted by the many venerid and tellinid species from the area, and by such shells as the frilly pink *Cardita finchi* (Melvill, 1898). Oddities like the winglike little *Crassatella radiata* (Sowerby, 1896), and the ark shells, the very descriptively named *Trisidos tortuosa* (Linné, 1758) and *Cucullaea cucullata* (Röding, 1798) with its internal "shelf," make the Bahraini fauna especially intriguing. Cone collectors will find it disappointing, though, as will marginella fans: one cone is pictured, *Conus dictator* (Melvill, 1898) (and the identification of that one is tentative only) and no marginellas are included. But *Mitra bovei* (Kiener, 1839), *Mitra pretiosa* (Reeve, 1844) and *Epitonium pallasii* Kiener, 1838) make it all worthwhile.

Besides its coverage of an area that has been little explored in popular literature, this book should be of interest to the collector and shell aficionado for its beauty. The endpapers and chapter beginnings are closeups of the nacre of *Pinctada radiata* (Leach, 1814), the "Bahraini Pearl Oyster." Each photo dwells lovingly on the specimen under consideration, giving attention to choice of complementary background and position, and showing equal affection for the chipped lip or decoliate specimen and the gem. Photographers of shells will appreciate the artistry and skill of the lighting and arrangement of the shell subjects.

A bibliography and an index complete the volume.

—Lynn Scheu

The Freshwater Mussels of Tennessee by Paul W. Parmalee and Arthur E. Bogan, University of Tennessee Press, Knoxville. US\$50.

One of the problems encountered by those who study and collect freshwater mollusks is finding adequate literature for the task of identifying their specimens. Most of what has been published is long out of print. Illustrations in most past works are line drawings. Some later works have black and white photos as illustrations. When these works are available the taxonomy is so outdated their usefulness is limited. There has long been a need for a book which would illustrate and discuss in detail that molluscan group that many find so difficult—unionids or freshwater mussels.

The Freshwater Mussels of Tennessee certainly meets the need. It is the latest in a series of books which chronicle the freshwater mussel fauna of a particular state and it sets the standard for similar works sure to follow. Approximately 130 species of freshwater mussels native to the state of Tennessee are illustrated in color; including two "typical" forms of each species. Excellent color photographs throughout this volume make it one of the most attractive and useful volumes for the freshwater enthusiast. Even those not interested in freshwater mollusks will find the cover attractive, and once they open the volume, readers are immediately intrigued with the diversity among the species and their various forms.

Much more than an identification manual or field guide, *The Freshwater Mussels of Tennessee* includes sections detailing structure and development, taxonomy, history of classification, ecology, faunal provinces of North America, diversity, aboriginal exploitation of mussels, history of modern mussel industries, distribution and translocation. Finally, species accounts of the families Margaritiferidae, Unionidae, Corbiculidae, and Dreissenidae are included.

The species accounts comprise the bulk of the volume. Here is found the book's greatest strength and its greatest weakness. Each species is identified by its scientific and common name. A complete synonymy is included, with notes explaining those synonyms which might seem questionable to the reader. The type locality is identified. The distribution is divided into "General Distribution" and "Tennessee Distribution." A detailed description of the species should be useful for those struggling with identification questions. A section detailing the life history and ecology for each species will be especially helpful to professionals working with this group. Where possible, fish hosts for each species are identified. Each species account concludes with a brief note regarding the conservation status. One of the most helpful features of the species accounts is the set of distribution maps which illustrate the distribution of each species in the state of Tennessee and within North America.

As stated earlier, it is in the species accounts where the problems of this work are found. The distribution maps are a work of tedium, but were found to be incomplete for more than a few species. I am most familiar with the unionids of Alabama, so of course I noticed when the North American distribution maps for a couple of species did not indicate distribution within my state when their distribution here has been widely reported. Early in this volume a list of species native to Tennessee is included. It is unfortunate that one species (*Villosa nebulosa*) included in this list was completely omitted in the species accounts. Thinking this taxa might have been synonymized under another name I searched the synonymies and found in the synonymy of *Villosa iris* that the authors stated they chose to treat *V. nebulosa* as a good species, yet still no account for the species was found. The section dealing with the conservation status of each species was what troubled me most. The conservation status of each species was discussed, but its federal and state status was ignored. Those who consult this book hoping to learn which species are federally listed as either threatened or endangered will be disappointed.

This work is very attractive, but not user friendly. Presumably as a means of saving space the species accounts are crowded. Occasionally,

photos of one species seem to go with the written account of another species. One has to carefully read the captions under the photographs to avoid confusion.

Nevertheless, I cannot say too much in praise of this book. It is a valuable resource for both amateur and professional. Even with its shortcomings, this book is definitely the "best game in town" for those studying freshwater mussels. It is easy to criticize the work of others, but let me close by saying I am thrilled with this book. It is a valuable reference in anyone's library and already among my most prized references. My compliments to the authors for contributing such an attractive, thorough and needed work.

—Douglas N. Shelton

From a Pre-Publication Announcement:

Atlas of the Land and freshwater Molluscs of Britain and Ireland by Michael Kerney, PhD. Harley Books, Colchester, England. 244 X 172 mm. Approx. 272 pp. Hardback. Due Spring 1999 £25.00 +£ 4.40 s/h overseas.

This atlas is the culmination of nearly forty years' work by members of the Conchological Society of Great Britain and Ireland. As a result of carefully planned routes which have taken conchologists to almost every corner of the British Isles... This must be one of the most thorough schemes undertaken and compares favorably with the Botanical Society of the British Isles' mapping of the British and Irish Flora. Fossil records are also plotted where they fall outside modern ranges. The exercise has led to the discovery of several species new to Britain and to the stimulation of research on others which has brought about important taxonomic revisions.

In the Introductory chapters, the "Factors influencing distribution" and "The History of the British Fauna" are examined. A section on the role of man provides an excellent analysis of the consequences of human interference on the British landscape in prehistoric and historic times which has brought about a continually changing fauna, not all of it adverse in terms of richness and variety.

This atlas, which treats each species concisely and gives vernacular as well as scientific names with common synonyms, contains dot-distribution maps accompanied by black and white illustrations; short notes on habitat; history (including fossil occurrence) and status; and the species' range outside the British Isles. A select bibliography includes over 200 books and scientific papers cited in the text... The author is co-author of *A Field Guide to the Land Snails of Britain and North-west Europe*.

MAM Meets in February

The Second Annual Mid Atlantic Malacologists, or MAM, will be meeting at the Delaware Museum of Natural History on Saturday, February 27, after this magazine goes to press. MAM is designed to facilitate contact among professional, amateur, and student malacologists interested in ANY aspect of mollusks and working in the Mid-Atlantic region of North America. Participants will be able to present and discuss data, compare notes on methods and problems, and stay informed of research activities and opportunities. Even busy malacologists have time to attend this one day meeting. Presentations (up to 15 minutes) range from informal talks about recent research, to ideas participants wish to bounce around with other malacologists, to polished talks. The meeting will be hosted by the very able and supportive Dr. Tim Pearce, Curator of Mollusks at the Delaware Museum, who is, himself, a land shell specialist.

MAM, like SCUM, is modeled after BAM (Bay Area Malacologists), founded in California by Gene Coan 25 years ago. We hope to provide readers with a report on this meeting in the June issue of *American Conchologist*.

Melbourne Shell Show in April

The Port Phillip Bay Shell Group is hosting the Melbourne Shell Show 1999 on Saturday and Sunday April 24-25. The show will feature competitive shell displays, shell craft sales, dealer tables, book auction and two guest speakers, Drs John Down and Bruce Livett, talking on their work with cone shells and their toxins. The hours are 1 p.m. to 5:30 p.m. Saturday and 9 a.m. to 4 p.m. on Sunday at the Hampton Community Centre, 14, Willis Street, Hampton, Victoria. For inquiries write Chris Bunyard, Secretary, Port Phillip Bay Shell Group, 21, Hillcrest Road, Eltham North, Victoria 3095, Australia.

AMS Awarding Scholarships

For the second year, the American Malacological Society will award grants of up to \$1000 in aid of student research. Instructions are available at the AMS web site at <<http://erato.acnatsci.org>; 80/ams/>. Both undergraduate and graduate students are welcome to apply.

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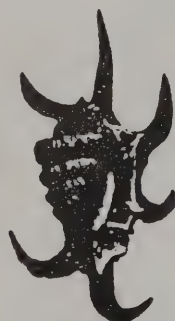
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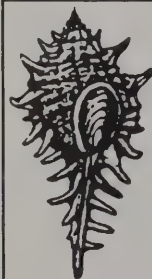
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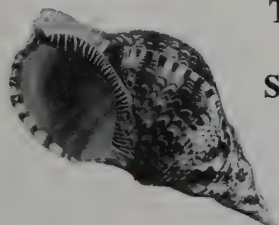
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MEETINGS:

Shellers Jamboree '99—An Underwater Fantasy: The Suncoast Conchologists sponsor their justly famous weekend get-together for shellers on Memorial Day Weekend May 29-31 at the Minnreg Building in Largo, Florida. All kinds of fun! For information or a registration form, send a stamped, self-addressed envelope to Roni Mucci, 795 County Road 1, #199, Palm Harbor, FL 34683. Phone: (727) 787-4968.

The 32nd annual meeting of the Western Society of Malacologists will be held at California State University, Fullerton June 13-17, 1999. A symposium entitled "Current research on west coast molluscan paleontology" is scheduled, highlighting molluscan paleontological research of California, Oregon, Washington, British Columbia, and Baja California. Contact either: Lindsey T. Groves, Natural Hist. Mus. LA Co., Malacology & Invert. Paleo. Sects., 900 Exposition Blvd, Los Angeles, CA 90007, Email: lgroves@nhm.org or Richard L. Squires, Calif. St. Univ. Northridge, Dept. Geological Sciences, 18111 Nordhoff St. Northridge, CA 91330 Email: richard.squires@csun.edu

1999 American Malacological Society meeting will take place in Pittsburgh, Pennsylvania, July 4-9, 1999. Information about the meeting is posted at the AMS web site <http://erato.acnatsci.org/amu/> or contact R. Prezant (rprezant@grove.iup.edu). This year there is a special workshop for collectors. See article elsewhere in this issue.

The IV Congreso Latinoamericano de Malacología, (IV Latin American Congress of Malacology) IV CLAMA, is going to be held in Coquimbo, Chile, from September 6 to 10, 1999. The meeting will be hosted by Universidad Catolica del Norte. Contact Dr. Roberto Cipriani, University of Chicago, Committee on Evolutionary Biology, Dept. of Geophysical Sciences 5734 S. Ellis Ave., H. Hinds Labs., Chicago, Illinois 60637. Email: rciprian@midway.uchicago.edu

Whelk Endangered?

There is a move afoot in Texas to afford protected status to the state shell, *Busycon pulleyi* Hollister, 1958 (See centerfold pp. 16-17). So far the bill seems only to be directed at shrimp fishermen; it seems that people believe that the shells are being wiped out by fishermen who trap them in their nets and trawls and then sell them as food. Sponsor of the Bill Sen. J.E. "Buster" Brown, R-Lake Jackson (Texas) says, "My bill goes along the line with not picking bluebonnets and not killing mockingbirds," referring to the official state flower and bird.

There does seem to be some evidence that *Busycon pulleyi* is declining in numbers in the western Gulf of Mexico, but it is likely that the decline is due more to changing environment than to overfishing. Fishermen deny the food rumor, and keeping the shells. They say they throw such mollusks back immediately due to the pressures of environmental regulations already in place.

The first Symposium of the newly formed **Freshwater Mussel Conservation Society** will be held March 17-19 in Chattanooga, Tennessee. The week-long conference has a packed schedule of speakers, posters and workshops on all phases of mussel habitats, life histories, propagation and conservation, concluding with field trips and a river cruise. Contact Dr. Paul Johnson, Southeast Aquatic Research Institute, 817-B North Market Street, Chattanooga, TN 37405, Phone (423)785-4074. Fax (423)266-5124. e-mail: pdj@sari.org.

The 16th Brazilian Malacological Meeting is planned for July 12-16, 1999 in Recife, Pernambuco, Brazil, at Hotel Recife Palace Lucsim, Av. Boa Viagem, 4070, Boa Viagem, Recife, PE, Brazil. The meeting is organized by the Brazilian Malacological Society. Contact Dr. Rosa de Lima Silva Mello, General Americano Freire, 394, sl.403, Boa Viagem, 51021-120 Recife, PE, Brazil. E-mail: cejem@elogica.com.br

MOLLUSCS 2000—Understanding Molluscan Biodiversity in our Region into the 21st Century will be held 4th - 8th December, 2000 at the University of Sydney, Sydney, NSW, Australia. Sponsored by the Malacological Society of Australasia, this is the second of the Society's three yearly meetings aimed at bringing together people working on molluscs in the Australasian and Indo-west Pacific regions. Contact Dr Winston Ponder, Australian Museum, 6 College St, Sydney, NSW 2000, Australia. Email: winstonp@amsg.austmus.gov.au OR wponder@mail.usyd.edu.au

The Ninth International Zebra Mussel and Aquatic Nuisance Species (ANS) Conference will be held April 26-30, 1999, in Duluth, MN. This looks like an excellent conference for the amateur, including even a workshop for youngsters. For more information, you can access the conference Web site at www.zebraconf.org, or contact the conference administrator, Elizabeth Muckle-Jeffs, at 800-868-8776 or by e-mail: profedge@renc.igs.net.

Interestingly, the bill fails even to mention the scientific name of the shell in question, perhaps because figuring out what it is could be tricky. *B. perversum pulleyi* was chosen as the state shell of Texas, but it appears to be more closely related to *Busycon sinistrum* Hollister, 1958, formerly known as *B. contrarium* Conrad, 1840, and many consider *B. pulleyi* to be a good species in its own right.

LAST CALL FOR SPEAKERS!

If you wish to give a program at COA 1999, mail a brief abstract of your planned presentation to:

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SNAILING AT TWO ENDS — MALAYSIA AND INDONESIA

by "Henry A. Martens"

photos by the author

photographic editing by Ross Gundersen

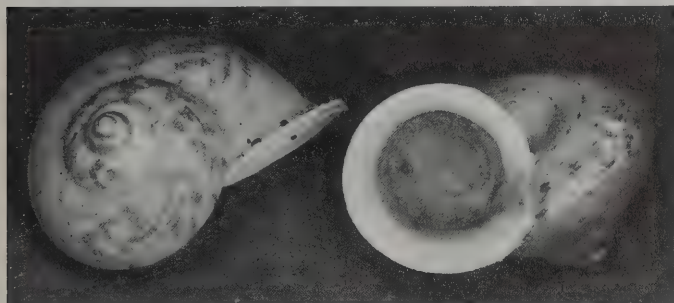
This was a west end trip — the western end of Malaysia and the western end of Indonesia. In northern Malaysia we went to Langkawi Island near the Thailand border and in Indonesia we visited Weh Island off the western tip of Sumatra.

Langkawi

Langkawi is an island of operculates, where I found 12 species in 6 genera, ranging up to 70 mm in diameter. Although there are areas of



Crassopoma inflammata is umbilicate, less than twice as wide as high, with a continuous aperture lip, which is offset near the suture line. Weh Island, Sumatra, Indonesia.



Cyclophorus aquila has a circular operculate aperture. Pulau Langkawi, Indonesia.

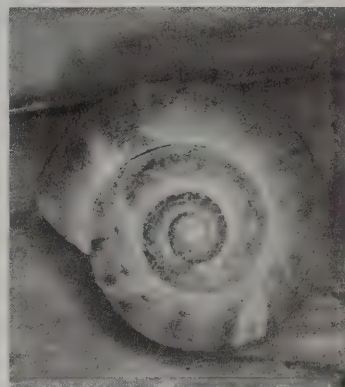


Animal togetherness — *Amphidromus atricallosus perakensis* and fly. Pulau Singa Besar, Indonesia.

limestone, sandstone and granite, the snails don't seem to discriminate among the sites. I visited a total of 11 localities and the limestone and granite areas had the most species. *Cyclophorus aquila* and *Dyakia janus* were the only species found on all three rock types. The 55 mm *Hemiplecta humphreysiana* and the huge 70 mm *Cyclophorus aurantiacus* were found on both limestone and granite.

Amphidromus, which in Greek means "double" for its dextral and sinistral shells, were found at two localities, the northeast coast of Pulau Langkawi at Black Sand Beach and at Pulau Singa Besar. The Black Sand Beach specimen of *A. atricallosus leucoxanthus* was found on the beach occupied by a hermit crab and entangled in a fishnet. It is recognized by having one or more varices and the parietal callus lacks dark markings. *A. a. perakensis* was found on Pulau Singa Besar at the inland edge of the level wooded beach area at the base of a slope. I checked the trees but didn't see any live specimens. It is distinguished by the lack of both varices and parietal callus coloration, but it has a distinct columellar plait. Both subspecies are yellow and range from Thailand to northern Malaysia. The Thailand specimens which have been figured are dextral. All of my specimens are sinistral.

On Pulau Singa Besar I also found *A. a. leucoxanthus* south of the picnic area. Both subspecies were on the island, but I did not find them occurring together. While searching for shells, I came upon snail mystery — was it an accident, murder, suicide, or natural causes? The evidence consisted of a two-foot wide rock surrounded by many shell fragments of a single *A. a. leucoxanthus*. There were shell fragments on the rock as well as around it. The shell fragments were bright yellow, making them easy to find, and were very thin-walled, indicating a young individual. A few feet away was a smaller rock with a body whorl on it and the apex was at the base of the rock. These two sitings were followed by a third and similar occurrence. There were no shells between the rock sites. The fragments not on the rock were on top of, or easily visible in, the fallen leaves. All the shells were without any trace of the animal. From the pristine



Sinistral *Dyakia janus*. Pulau Langkawi, Malaysia.



Amphidromus niasensis has a radial color pattern. Weh Island, Sumatra, Indonesia.



Is the strange aperture of *Pterocyclus anguliferous* a sun shade? Pulau Langkawi, Malaysia



The evidence in our mystery—A broken shell of *Amphidromus atricallosus leucoxanthus*. Pulau Singa Besar, Malaysia.

condition of the fragments on top of leaf cover, I believe the fall was a recent event. There are several possible scenarios:

1) Did the animal die and dehydrate during aestivation on the tree, fall, hit the rock, and get thrown from the shell on impact?

2) Was the live animal in the shell when it was knocked from the tree, and then removed after impact?

3) Was it the result of a suicide pact? A snail's life may not be all fun and games. Perhaps these three animals were an irreconcilable triangle.

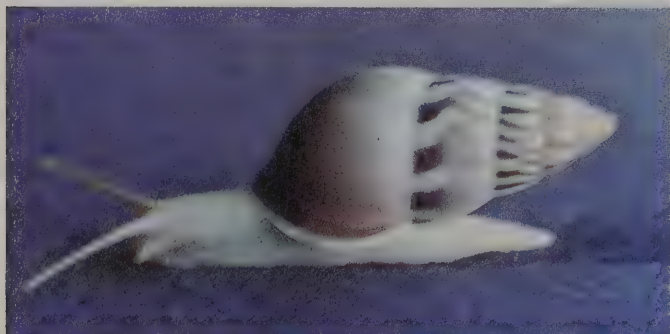
4) The lack of shells between the sites may indicate that the rocks are the common factor. Were the shells dropped on the rocks by a predator to break the shell for easy access to the animal? Do birds or monkeys eat *Amphidromus*? The genus *Dyakia* is reported as often being eaten by monkeys. Snail shells have been found in the cheek pouches of longtailed macaques, present on the island. There are reports of birds breaking land snail shells by hitting them against rocks. I don't know of any snail-eating birds on Langkawi.

5) Were they the result of a commuting accident? Maybe they were commuting to the ground by free fall and accidentally hit a rock. An observation on *Achatina fulica* states, "... Snails which have ascended trees, walls, etc. do not climb back the way they have come, but let themselves drop down. Although a well developed shell can withstand an enormous pressure, the sharp knock when reaching the ground often causes it to crack open. Obviously this behavior is the cause of many smashed shells to be found on hard patches (streets, etc.) underneath trees."

6) Was it sky diving with a faulty parachute?

I guess we'll never know.

There are many bioluminescent mollusks, but rarely does bioluminescence occur in terrestrial mollusks. *Quantula striata* is a bioluminescent snail. It has a weak yellow-green flash of from 0.5 to 6 sec-



Amphidromus sumatranus was found on banana leaves at a local market. Banda Aceh, Sumatra, Indonesia.

onds' duration. The only other bioluminescent terrestrial mollusk is *Cystopelta*, a slug from Tasmania. *Quantula* was only found at one locality. Unfortunately, it was an empty shell so I couldn't check out its light.

Let me describe three Langkawi locations, two on limestone (11 and 9 species) and one on granite (10 species). The first limestone area is Tasik Dayang Bunting (Lake of the Pregnant Maiden) on Pulau Dayang Bunting. This is an unusual setting. The large island is walled by thickly forested limestone cliffs which rise several hundred feet from the sea. We landed at a dock and walked a few minutes up a well maintained concrete trail to a view of the lake. The trail then descended abruptly to the lakeshore where large floats are utilized by the swimmers and boaters. Floats are used because the lake level, about 20 feet above sea level, fluctuates with the tide. The lake is about 50 feet deep off the floats. The large lake is situated in a great depression surrounded by vertical cliffs. It may be the result of a huge, collapsed solution chamber. At the other end of the island is a 91 meter-high cave, Gua Langsir (Cave of the Banshee) and there are probably many more solution chambers on the island. I asked a local for the dimensions of the lake. The answer was, "The lake is oval and it takes five minutes to swim across and ten minutes to swim the length." I didn't know whether this was with or without swimfins, but I estimate the lake to be about a quarter mile across and a half mile in length.



The sun fades the color pattern on *Cyclophorus auratiacus*. Pulau Langkawi, Malaysia.

There is a trail encircling the lake. On my first visit of an hour's duration, I walked clockwise only a few hundred yards, but on my second visit of 3.5 hours, I circled the lake. Along the lake trail at the base of the cliffs, I found the 24.8 mm *Pterocyclos anguliferus* with its strange aperture and the 14 mm *Opisthoporus rostellatus* with a detached aperture and siphon tube, *Dyakia janus*, *Hemiplecta humphreysiana*, and two others needing identification. I saw no live specimens.

The second limestone area was at Tanjung (Cape) Rhu in the northern part of Langkawi. The outcrop is along the road south of the Radisson Plaza Suite Resort. Collecting at the base of the cliff was great for snails, but I also found, though I did not collect, a 6-foot cobra. The cobra was resting in a solution chamber at about ground level. It hissed and, when provoked by my guide, spread its hood but did not strike. To add to the experience, the vegetation was literally covered with half-inch long red ants which bite. Fending off the giant attack ants at the same time as encountering the cobra was an experience never to be forgotten. Found some live snail specimens, including 4 Cyclophoridae species, *Dyakia janus*, *Quantula striata*, *Trochomorpha* sp. plus three more snails to be identified.

The best granitic locality was the mile long road between the Burau Bay Resort and Telaga Tujuh (Seven Wells Waterfall). It is a flat, more-or-less open area with second growth vegetation and occasional

granite outcrops. I was surprised to find the large *Cyclophorus aurantiacus*. My experience collecting on granite in other parts of the world has not been very productive. Maybe at the other localities it was due to the association of pine trees and their acid duff. Saw no live specimens.



The foot of *Helicarion perfragilis* can't be retracted inside the shell. It is "on the road to slugdom." Weh Island, Sumatra, Indonesia.

Weh Island

Our final destination was the island of Weh off the western tip of Sumatra. We arrived at Balokan on the south end of Weh after a two-hour ferryboat ride from Banda Aceh on the northern tip of Sumatra. The van ride across the island to Sabang revealed farms and small villages in the lowlands and primary and secondary forests on the slopes. Sabang, the main city on the island, is also the main shipping port. On Weh I collected at 11 localities.

At Sabang we stayed at a converted manor house on a hill above the city. The first morning it took a long time to have breakfast. In an attempt to alleviate this problem we ordered our breakfast choices and eating time the night before. This worked very well: the food was put on the table an hour before the scheduled time. Maybe we should have been smart enough to arrive for breakfast an hour early.

Unlike Langkawi, Weh is volcanic. There are active sulphur vents and several hot springs. The major primary forest is on the northwest peninsula. In general, collecting was best at the edge of this primary forest.

One such locality was near the entrance to Iboih village. We walked around cultivated fields to the forest. Unlike our experience at Langkawi, the sky was overcast and the soil was damp. On the lower leaves were many *Macrochlamys sabangensis* with a 14 mm tightly coiled, thin, shiny brown shell. On a leaf I saw what appeared to be a silky cocoon. On closer examination I found it to be a 20 mm slug, *Meghimatum* sp. It is probably the most delicately colored "snail" I have collected. The yellow of the visceral mass showed through the mantle and the delicate blue-based tentacles peeked out from under the papillate mantle. Three individuals were seen, one on either side of the same leaf, and one on a leaf my guide was about to eat!

Also found two one-inch long, thin-shelled sinistral species of *Amphidromus*. *A. ilsa* is all yellow and *A. niasensis* has brown radial bands resembling a sinistral *Achatina fulica* but without a truncated columella. The two species occurred together at several localities.

Summary and Observations

The two island localities, although at the same approximate latitude (N6 15' for Langkawi and N5 45' for Weh) and 300 miles apart, presented an opportunity to explore different soil types, habitats, and



Macrochlamys sabangensis out for a walk. Weh Island, Sumatra, Indonesia.

landsnail associations. The wetter habitat on Weh may account for seeing a greater number of live individuals.

Amphidromus species from both islands were found in the open forest with little undergrowth. They were limited in their distribution: the Langkawi species were not found on Weh and vice versa. The operculates, except *Leptopoma*, were found on or in the ground. The soil type (limestone, sandstone or granite) did not seem to be a distribution factor. There was no correlation with soil type.

Dyakia were seen on Langkawi but not on Weh.

Helicarion were seen on Weh but not on Langkawi. This may be due to the wetter habitat.

The tropical tramps *Lamellaxis gracilis*, *Subulina octona*, *Bradybaena similaris* and *Achatina fulica* were on both islands in disturbed areas near human habitation.

The large, thick-shelled *Cyclophorus aurantiacus* occurred on limestone and granite without any difference in shell thickness. From past experience with *Achatina fulica*, I would have anticipated thicker shells on the limestone than on the granite. Maybe the calcium source is not the soil.

I learned the snail productivity of a locality is dependent on many factors, including time of day, weather, length of search, and variety of habitats.

It was an interesting and enjoyable snailing trip to the ends of Malaysia and Indonesia.



Meghimatum is an attractive, delicately colored slug. Weh Island, Sumatra, Indonesia.

NEW FINDINGS ON THE BRAZILIAN COAST

by José Coltro

Photographic Editing by Ross Gundersen



Conus species, 38 mm, trawled at 400 meters, off São Sebastião Island, São Paulo State.

During 1998 we had some good shelling trips along the Brazilian coast. Our boat *Oceanus* dredged between Guarapari and south Bahia State. We dove in Guarapari, Ilhabela, Salvador and at new points like the Rio Grande do Norte State coast. We contacted new fishing boats in São Paulo, Rio de Janeiro, Espírito Santo and Bahia States. The results of these efforts are great. We found over 30 new species—some really fantastic finds like great trawled *Conus* or a large number of Marginellidae found by divers.

The trawlers along the São Paulo coast brought several really unusual purple-white-brown *Conus*, just enough to study them. They also brought from deep water (400 meters) a single yellow-white and ribbed *Conus*. A large number of Turridae came in, too. But who knows if turrids are new or not? They also brought from Espírito Santo State, two new and extremely colorful *Conus*.

Oceanus also made some great finds. Dredging along the Espírito Santo Coast, our crew found a gorgeous new *Calliostoma* - pale pink with brown lines and a deep dark purple umbilicus. A new *Turbo*—one that we thought at first to be a young *Turbo canaliculatus* Hermann, 1781, but the shell has a dark red protoconch, is extremely ribbed and has a green nacreous interior. Some new small



Conus species, 48 mm, trawled at 70-80 meters, off Santos, São Paulo State.

Femorale, CX-P. 15159, São Paulo, CEP 01599-970 Brasil
Email: femorale@br.homesshopping.com.br

Columbellidae (in the genus *Nassarina*) and Turridae were also found. But a deep yellow-orange *Conus* was the most exciting find.

Our diver, Alfredo Bodart, went with us to Bahia State where he found spectacular shells. It is amazing how he is able to find these unusual specimens while diving right at your side! You don't see a single broken shell but he always find them! Alfredo found another specimen (and the most beautiful) of a new Marginellidae (genus *Bullata*) that is being described. I illustrated it in *American Conchologist* in September 1997 [25(3): p.32]. And he found something really amazing: in a reef about 40 miles off Porto Seguro, south Bahia, he found a dead and broken *Lambis scorpius*... (probably from some cruise boat....)



Bullata species, 28 mm, in coral sand at 15-20 meters by diver, off Alcobaça, Bahia State.

Last December I took Alfredo to dive along the Rio Grande do Norte Coast where our results were the best of the entire year. We found a new *Conus*, one that I was considering to be *C. beddomei* Sowerby, 1901, but my friend Bill Cargile proved to me that this is strictly a Caribbean species. This *Conus* may be a local sub-species of *Conus brasiliensis* Clench, 1942 or even a new species. Dr. Luiz R. Simone, from our Zoological Museum is studying the animal. Other great species, specially in the Marginellidae family, were found. My friend, Dr. Paulino Souza, from the University of São Paulo is completely astonished with the quantity — at least eight new species in the genera *Volvarina* and *Prunum*. We also found new Olividae (*Olivella*), Fasciolaridae (a beautiful orange-red and yellow *Latirus*), Trochidae (*Calliostoma*), Turridae and especially a new volutid, in the genus *Enaeta*.

All of these new shells are being studied by Brazilian scientists. They just go to show that the Brazilian coast is one great place for new species! (Photographs continue at top of next page.)



Conus cf. *brasiliensis*, 32 mm, in coral sand with grass at 20-25 meters by diver, off Natal, Rio Grande do Norte State.



Latirus species, 23 mm, under rocks at 20-25 meters by diver, off Natal, Rio Grande do Norte State.



Enaeta species, 20 mm, under rocks in coral sand at 20-25 meters by diver, off Natal, Rio Grande do Norte State.

American Malacological Society Policy on Biological Conservation

COA members may be interested in the AMS' current policy on conservation.

The American Malacological Union (AMU [Now AMS]) believes that the interests of malacology (the scientific study of mollusks), of science in general, and of the well-being of the human race are best served by the protection of intact ecosystems and their naturally occurring biodiversity. The AMU therefore supports measures at all levels of government and society, throughout the world, to:

1. Protect natural biodiversity in general, proactively;
2. Protect threatened and endangered species;
3. Protect natural ecosystems of sufficient size and configuration to be self-sustaining;
4. Manage adequately natural reserves established for the conservation of biodiversity;
5. Prevent invasion of natural ecosystems by non-indigenous organisms;
6. Prevent human-produced pollution from degrading ecosystems and threatening their natural biota.

The AMU specifically supports measures to:

7. Ensure that fisheries and collecting activities impacting natural populations of mollusks are conducted only on a sustainable basis;

8. a) restrict shell-collecting for commercial gain, especially for rare or endangered species; and b) minimize habitat destruction and prevent destructive practices such as the use of toxic chemicals and explosives;
9. Encourage awareness among shell-collecting hobbyists that their activities may impact natural populations of mollusks, and that they should focus their collecting activities on the more common species and/or dead specimens, consider substituting photography for collection of live specimens, and avoid damage to habitats;
10. Encourage awareness among professional and professional-level amateur researchers that their activities may impact natural populations of mollusks, and that they should restrict their collecting activities to the minimum necessary to address the specific research needs, and that these research needs should be evaluated against a background of the status of the mollusk species in question, and of potential damage to habitats.

Furthermore, in support of mollusk conservation and the conservation of biodiversity more generally, the AMU calls for adequate, coordinated governmental and private support to enhance efforts by professional and professional-level amateur malacologists to generate, synthesize, and make available information about molluscan ecology and the role of molluscan biodiversity in natural ecosystems, thereby enhancing our ability to conserve mollusks.

Specifically, the AMU [AMS] prohibits the selling, buying or trading of shells or shell products at its annual meeting. —As reported in the *Association of Systematics Collections Newsletter* Vol. 25, No. 5.

AMS to Host Workshop for Amateurs by Charles Sturm, Jr.

Have you every wondered about the way museums maintain their collections? Setting up a database for your collection? Fostering a working relationship with professional malacologists? Well wonder no more! On July 7th, there will be a workshop during the American Malacological Society's 1999 meeting in Pittsburgh to address these and other issues. The speakers are a varied group but all have roots as amateurs or are professionals with a strong interest in helping the amateur community. **Charlie Sturm**, research associate at the Carnegie Museum in Pittsburgh, is the organizer for the workshop and will lead off the program, discussing the archival practices used in modern collections—inks, paper, computer printers, electronic information—as well as Bynes Disease, and Charlie's specialty, the care and archiving of Cenozoic fossils.

Gary Rosenberg, Curator at the Academy of Natural Sciences in Philadelphia, will be presenting the ins and outs on database construc-

tion, including commercial software, fields and structure, catalogue pages, and more. Bring your questions and ask the master database designer how to do it.

Jose Leal, Curator of the Bailey-Matthews Museum in Sanibel, will be speaking on amateur-professional relationships and how to get the most out of them.

Tim Pearce, Curator of Malacology at the Delaware Museum of Natural History, will be speaking on how amateur collections can be incorporated into a museum collection, and how the curator and collection manager can assist the amateur in curating his collection prior to a donation, and problems associated with such donations.

Kevin Cummings, Research Scientist for the Illinois Natural History Survey, will discuss how to collect unionids, conservation issues, available literature and how to maintain a collection of freshwater mussels.

Dick Petit will review some of the literature in malacology, including the main journals, books, and series in malacology.

This workshop represents a giant step forward for AMS in attracting and accommodating the needs of amateurs in the organization.

CONCHATENATIONS

Mollusks in Literature

by Gary Rosenberg

Most of the conchological quotations presented in my column of December 1998 are merely brief references to mollusks in literary works. Mollusks are featured more prominently in a select group of sources. More than 200 works of fiction have words such as "snail," "slug," "clam" or "limpet" in the title. These can easily be found by searching websites on the Internet where books are sold or catalogued, for example, www.amazon.com (for new books); www.bibliofind.com (for used books); and lcweb.loc.gov (the Library of Congress). These sites often provide brief summaries and so are useful for locating works of fiction with molluscan themes that are not apparent from the title. My citations refer to the first edition of each work; publishers are based in New York City unless otherwise stated.

General Fiction

My favorite literary passages about mollusks occur in *Corelli's Mandolin* by Louis de Bernières (Pantheon Books, 1994), a novel set on the island of Cephalonia, Greece during World War II. Chapter 41 describes an expedition to collect snails, and much of chapter 43 details attempts to cook them and their escape:

All [the doctor] could think of was the repellent and astounding spectacle he had just encountered in the kitchen. 'Who,' he roared rhetorically, 'has had the audacity to fill my house with snails?'

It was true. There were snails everywhere. They were on the windows, under the rims of tables, perpendicularly sideways on the walls...in the water jug, glued inadvisably to the mats, proceeding with determination towards the vegetable basket, and clinging with quixotic relish to the stem of the doctor's pipe....Pelagia put her hand to her mouth in guilty horror, and Lemoni, perceiving the silvery, meandering, crisscrossing, glistening trails, and the delightfully random distribution of the beasts themselves, clapped her hands together in joy [p. 263].

Another, more sinister tale is in Patricia Highsmith's *The Snail Watcher and Other Stories*. (Doubleday, 1970), where a man's success in raising snails leads to his death. In Jonathan Carroll's novella, *Black Cocktail* (St. Martin's, 1990), which has *Epitonium*, *Nassaria* and *Architectonica* on the dust jacket, the mysterious appearance of seashells in characters' pockets indicates a supernatural kinship among them. Leo Rost's *The Conch Eaters* (Wollstonecraft: Los Angeles, 1973) is a novel about big-time gambling set in the Bahamas. *Mussel*, by Phillip Quinn Morris (Random House, 1989) is the story of a body-builder turned mussel-diver. (Although the title refers to freshwater mussels, the chapter headers have halftones of marine mussels.)

Some are classics, such as *The Octopus* by Frank Norris (Doubleday, Page, 1901), others are first novels, that have not yet stood the test of time, like *The Gasteropod* by Maggie Ross (Viking, 1969). Science fiction has spawned a few: John Wyndham's *Kraken Wakes* (Michael Joseph: London, 1953) and Richard Miller's *Snail* (Holt, Rinehart and Winston, 1984), in which a World War I soldier has the ability to travel in time in various forms. The title of Janette Turner Hospital's *Oyster* (Knopf: Toronto, 1996) is also the name of the main character:

Opal. The word itself was like a charm. You could stroke a word like opal. You could taste it. You could swallow it whole, raw and silky, like an oyster, and then Oyster could reel you in [p. 11].

Often only a paragraph or two in a book will be devoted to mollusks, but these short passages can reveal the author to be a careful observer. An good example is David Guterson's, *Snow Falling on Cedars* (Harcourt Brace, 1994):

At the turning of the tide the horse clams emerged, shooting jets of water like miniature geysers hidden among the eelgrass. Down the mud flats small fountains erupted, dozens of them, spurting two feet or more, then again, then lower, then dwindling and stopping. The geoducks raised their necks from the mud and aimed their lips at the sun.

The siphons at the ends of their necks glistened. They blossomed delicately white and iridescent out of the tidal morass.

The two of them knelt beside a clam siphon to discuss the particulars of its appearance. They were quiet and made no sudden movements—movements inspired shyness among clams and encouraged them to withdraw. Hatsue, her bucket beside her, her shovel in one hand, pointed out the darkness of the exposed clam's lip, its size, its hue and tone, the circumference of its watery dimple. She decided that they'd stopped beside a horse clam.

They were fourteen years old; geoducks were important. It was summer and little else really mattered.

This passage calls to mind another literary encounter with clams, this one non-fiction, in Henry David Thoreau's *Cape Cod* (Ticknor and Fields: Boston, 1865):

Our host told us that the sea-clam, or hen, was not easily obtained; it was raked up, but never on the Atlantic side, only cast ashore there in small quantities in storms. The fisherman sometimes wades in water several feet deep, and thrusts a pointed stick into the sand before him. When this enters between the valves of a clam, he closes them on it, and is drawn out. It has been known to catch and hold coot and teal which were preying on it. I chanced to be on the bank of the Acushnet at New Bedford one day since this, watching some ducks, when a man informed me that, having let out his young ducks to seek their food amid the samphire (*Salicornia*) and other weeds along the river-side at low tide that morning, at length he noticed that one remained stationary, amid the weeds, something preventing it from following the others, and going to it he found its foot tightly shut in a quahog's shell. He took up both together, carried them to his home, and his wife opening the shell with a knife released the duck and cooked the quahog.

Childrens' Books

Most molluscan fiction lies in the realm of children's books, where marvelous illustrations and whimsical tales abound. The most recent addition to my collection is (yes, I've been bitten by the collector's bug again and in the last few months have acquired copies of several of the books mentioned in this article) *Snail Girl Brings Water: A Navajo Story* by Geri Keams (Northland: Flagstaff, Arizona, 1998). It is a richly illustrated rendition of a traditional Navajo creation myth.

Other favorites include *Some Smug Slug* by Pamela Duncan Edwards (HarperCollins, 1996), the sibilant story of a slug's succulence; *Snail Mail* by Hazel Edwards (William Collins: Sydney, 1996), about a snail who lives in a mailbox and grazes on letters; *The Snail's Spell* by Joanne Ryder (Frederick Warne, 1982), with the magnified world of a child imagining the sensations of a snail; *The Pattaconk Brook* by James Stevenson (Greenwillow, 1993), in which Sidney the Frog and Sherry the Snail "ride down the Pattaconk, glide down the Pattaconk, slide down the Pattaconk, down to the sea"; and *The Lace Snail* by Betsy Byars (Viking, 1975), about a snail who uses her lacy trail to make gifts for other animals.

There are many more that I have never seen, but the titles suggest further delights:

Allen, Steve: *The Bug and the Slug in the Rug* (Greene Bark: Bridgeport, CT, 1995).

Brown, H. Jackson Jr.: *When You Lick a Slug, Your Tongue Goes Numb* (Rutledge Hill, 1994).

Cross, Odo: *The Snail that Climbed the Eiffel Tower and Other Stories* (John Lehmann: London, 1947).

Kraft, Eric: *Do Clams Bite?* (Warner, 1986).

Lifton, Betty Jean: *The Mud Snail Son* (Atheneum, 1971).

Manning-Sanders, Ruth: *The Magic Squid* (Methuen: London, 1968).

Pollock, Penny: *The Slug Who Thought He Was a Snail* (Putnam, 1980).

Stevenson, James: *Clams Can't Sing* (Greenwillow, 1980).

If each COA member donates a few such books to his local library (and better yet, puts a few shells on display there), perhaps a new generation of conchologists will find inspiration. I will provide a list of titles to interested COA members on request.

LETTERS:

With apologies to both the author and the memory of Mary Ford, we print the following letter, received too late for the September issue, due to the vagaries of the U.S. Mail, and omitted from the December issue in error.

This note is to inform you of the passing of Mary S. Ford, widow of the late E. Flynn Ford, both of Fort Lauderdale, Florida. Mary died May 11, 1998 in St. Louis, Missouri of a heart attack following several strokes days prior.

She and Flynn are buried next to each other in St. Louis.

Mary and Flynn had many friends, as members of the COA, the Broward Shell Club, the South Florida Shell Club, and shell clubs on the west coast of Florida, in St. Louis, and other parts of the country. They were very active in showing shells and supporting their clubs, and in supporting the American Museum of Natural History and bringing their trophy to the South Florida clubs. Mary will be greatly missed by all the old-time shell club and COA members, as is Flynn. She was a great friend.

Sincerely,
Fred L. Leonard

Letter to the Editor: Thanks for a Job Well Done

My wife and I were recently discussing the internet and the subject of the COA sponsored Conch-L came up. I am not sure if many subscribers to Conch-L even realize it is sponsored by COA. But I for one want to make sure you are thanked for this great effort. Your e-mail discussion group seems to have grown into a useful mechanism in any number of ways. I have often argued that conventions are useful for the information formally presented but even more useful are the opportunities for informal discussion with leaders and amateurs alike in a given field. With Conch-L, I have an opportunity for that experience every day. Discussions range from how to clean a shell to the

identification of a shell to the meaning of species. Or put another way, from a simple beginner's question to a complex and scientifically debatable issue. Conch-L does not replace or equal the excitement, color, and fun of a COA convention; but it does provide an unequalled opportunity throughout the year. The magazine is the formal program and Conch-L the hallway, dinner table, and meeting room discussion.

In the past year I have met a number of people on Conch-L that I now count as friends. And these are friends I may never have met otherwise. Because we met "electronically" the playing field was level. A young student like Sarah would have a tough time presenting her ideas to four or five senior conchologists (amateur or scientist, the effect is the same) in heated discussion about the meaning of species. With Conch-L she has an equal opportunity to be heard. She is just one of many given the chance to speak out and maybe spark an interest in someone else on the list. Harry rekindled my interest in Xenophoridae, Jr and Paul helped me with some long standing Neritidae issues, Mark kept it all in perspective with his humor and cynicism, Carlos opened my eyes to some European shells I had ignored, John (and many others) gave me solid advice about shell club dynamics, and the list goes on. These are all people I met because of Conch-L and each has given something of solid value to me. In fact, the highlight of a recent trip we took to the west coast was a very short but laughter filled and warm meeting with Dan and Hiromi—whom I met through Conch-L.

So I thank you for Conch-L and the great service you provide. We often talk and write about the ancient nature of man's interest in shells. In fact, we could sometimes be accused of being just a bit pompous about our hobby or field of study. It is refreshing to know a major organization in the field can look forward and embrace new technology. Because of that, in a year I have learned more about shells than many past years combined and just as important, I met many new people and quite a few friends. Oh yes, I am also sending in a COA membership application after having let my membership lapse for a few years.

Thank You,
Tom Eichhorst

ANSP and PSC to Hold Auction

The Philadelphia Shell Club and the Academy of Natural Sciences will have an auction of rare and desirable shells and books on May 15, 1999, 10 am to 4 pm at the Academy (books in the morning, shells in the afternoon). Highlights of the auction will be books from the library of Leonard Hill and shells from the collection of Dr. Meyer Naide. Proceeds from the Hill and Naide items will go to the Academy's malacology endowment, to support the research collections. For information contact Gary Rosenberg at the Academy of Natural Sciences, Philadelphia, 1900 Benjamin Franklin Pkwy, Philadelphia PA USA 19103-1195 Phone (215)299-1033 Email: rosenberg@acnatsci.org

Parasitic Muricid?

Researchers at the Florida Department of Environmental Protection's Marine Research Institute have been studying populations of the bay scallop for the past 5 years. Dr. Dan Marelli and Dr. Bill Arnold noticed that many of the scallop shells have been drilled successfully by the Gulf oyster drill, *Urosalpinx perrugata*, but that the scallops were not being killed. Scallops are apparently surviving the oyster drill attacks and actually repairing the drill holes afterwards. Scallops were often found with numerous complete drill holes, as many as 13 on one scallop, suggesting that the scallop is being parasitized by the drill. This was an unexpected observation, as the researchers assumed that the oyster drill would kill scallops, as *Urosalpinx cinerea* does in the northeast U. S. Marelli and Arnold plan to publish this observation, and would like to see a graduate student do some experimental research on the association between the drill and the scallop.



FLOWERS TO:

Gladys McCallum on the loss of her beloved husband, Lt. Colonel John McCallum on December 18, 1998

Betty Jean "The Tall One" Piech who has had leg surgery and is doing well, we hear!

In Memoriam

John McCallum

Mary L. Hughes

Walter Shirey

OOPS!

"In my Venezuela article in the December issue of *American Conchologist* (p. 8) I inadvertently misquoted Dr. Harry Lee when I wrote that the *Calliostoma* cf. *depictum* from Venezuela may be 'clinically conspecific' with the Brazilian form. Instead, his words were that it was 'clinally conspecific' with the Brazilian form. This was MY error and not that of our editor's."

—E. Garcia

There was an error in the address line of Harry Lee's article on "Western Atlantic Nassariidae" on page 18 of the December *American Conchologist*. Harry's mailing address is Suite 500, not Suite 750.



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Cyphoma signatum Pilsbry & McGinty, 1939,
the Fingerprint Cyphoma, contentedly munching away on a frond of *Plexurella*.
This cyphoma will also be found associated with sea fans.

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CONCHOLOGISTS



OF AMERICA, INC.

VOL. 27 No. 2 JUNE 1999

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: *Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.*

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MEMBERSHIPS are for the calendar year, January-December, late memberships retroactive to January. **1999 DUES:** (USA, Canada, Mexico) \$20.00; **Postal Surcharge:** \$10.00 for other Western Hemisphere nations; \$12.00 for Europe; \$15.00 for Asia, Africa and the Pacific Rim. Please pay in U. S. dollars with a check drawn on a U. S. bank with Transit Enrouting and Account Numbers printed at the bottom, or with money order; make checks payable to CONCHOLOGISTS OF AMERICA. **NEW MEMBERS** apply to Doris Underwood, **MEMBERSHIP DIRECTOR**. **RENEWALS** go to **TREASURER**, Bobbie Houchin. **BACK ISSUES** are available from **PROPERTIES DIRECTOR** Hank Fogliano, 4 Trent Court, Smithtown, NY 11787-1266. Prior to 1985 \$3.00 each; 1985 to current \$5.00 each.

PRESIDENT'S MESSAGE

ATTENTION ALL COA MEMBERS! You've heard all the hype about the convention auctions. Well, this is NOT hype! This is an eyewitness report. How can you get an eyewitness report before an event, you ask? You can get it because every shell in these events passes through the same hands that are typing this note.

First, let's talk Silent Auction. The quality of the specimens in these auctions is superb. Actually, we've had quite a time deciding whether to put many specimens in the bid auction or in one of the silent ones. We have specimens that are not expensive but are rarely offered for sale. We have many specimens that are quite large for the species. Simply put, we have quality.

One of the results of all this is that we have a new auction feature. Our convention committee has created a new category of silent auction. It is called, in keeping with the horsy theme, "The Also Rans: The Best Silent Auction Ever." This is a one shot auction filled with shells that were too good for the silent auction but were knocked out of the bid auction for one reason or another.

And the bid auction.....well, right now we are holding at 160 items. Once the lots are grouped the number of items will decrease, but we still have donations coming in. What do we have? If you are a cowry collector, we have *C. friendi*, *C. venusta* and forms, and a *C. fultoni*. If you are a cone collector we have *C. gloriamaris*, two *C. bengalensis*, *C. dusaveli* and many other rare specimens. We have *Latiaxis*, even one or two from an old collection from the Galapagos. We have pectens, some color forms I have never seen. There is too much to describe. You'll just have to come to Louisville and see these phenomena for yourself.

See you in Louisville!

Linda Brunner

ADVERTISERS TAKE NOTE!

American Conchologist has a new Advertising Manager, Howard Roux of Naples, Florida. Howard has taken over the position from our old friend Glen Deuel, who has faithfully and capably served COA in this capacity since 1995, and who retired in January. The editor wishes to thank Glen for his years of dedication to COA and **American Conchologist**, and to issue a pleased (and belated) welcome to Howard as our new Advertising Manager; Howard has been on the job since Jan. 1. You can reach him at 152 Coral Vine Drive, Naples Florida 34110 Phone: 941/514-0541. Email: conchman@mindspring.com

COVER CREDITS: Award winning artist Leigh Murphy returns to the cover of **American Conchologist** with another of her intriguing watercolors. Her fascination with light, color, texture and shape reaches fulfillment in her depiction of shells, while her wizardry with watercolor and fabric evokes moods to match the shells. This cool, quiet portrait of three common shells, *Lambis chiragra*, *Tonna galea* and *Hexaplex brassica*, is a restful contrast to the excitement of Leigh's sunwashed portrait in red, white, and blue that appeared on the cover of the June 1998 **American Conchologist**. Leigh, a member of the Jacksonville Shell Club, can be reached at 1536 Ingleside Avenue, Jacksonville FL 32205. Phone: (904)387-0619.

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You'll Love Louisville!

Convention Registrants: After June 8, the block of rooms reserved at the Galt House for the COA Convention will be released for general sales. There may be rooms available after this date, but they will not guarantee convention price nor availability. If you are coming to the convention but have not made a reservation yet, do it immediately. The Galt House phone number is 502/589-5200. Please note there will be a **\$50 charge** for early checkout. How this works: If you register for Sunday night through Thursday night and decide, **AFTER** you have checked in at the hotel, to leave on Thursday morning, you will be charged \$50 at checkout. If, on the other hand, you **DID** notify the hotel of your intention to check out early before check-in or notify them of your intent at check-in, there is no charge. In other words, if you check in and **THEN** decide to leave early, you **WILL** be charged the \$50.

As of this writing, there are still a few places left on all the field trips on Friday. The **Bardstown trip** has unlimited space, but the others are almost gone.

Caesar's Indiana has supplied free passes to their facilities for everyone attending the 1999 COA Convention in Louisville, and a shuttle from the hotel to the boat. The brand new Caesar's Indiana is just a few miles from Louisville, on the Indiana side of the Ohio River.

Kim Hutsell, author of *Registry of World Record Size Shells*, will

be at the convention to measure record size shells. Be sure to bring your world record contenders with you to Louisville for verification. Note that Kim will **not** be filling out your "Record Submission and Verification Form" for you. You must bring a completed copy of the form with you to have your shell(s) measured. There is a copy of this form in the back of the 1997 edition of *Registry of World Record Size Shells*. We hope to have a limited number of these forms available at the registration table on Sunday and Monday if you do not have access to the Registry or have used your only copy of the form. But you will need to know the collecting location for your shell to complete this form, so come prepared with that information.

Also, we will be providing space in the Shell Derby area for you to display your world record size shells, both new contenders and old world record holders. This display will be available to the public from Sunday until Tuesday morning. All you must do is bring a display case for your shell. Security will be provided.

Deadline for entry in the Great Shell Derby is June 10. If you have not sent your entry form yet, do it immediately. If you do not have a form yet, contact Gene Everson immediately at 502/429-5788. There is still some space left in this event.

There will be a number of authors at the convention. If you have books you want autographed, Art Weil and Bruce Neville, Gary Rosenberg, Ross Gundersen, Debbie Wills, Karen Couch, Donald Bosch, Emily Vokes, Bob Lipe, and others will be here in June. Bring your books.

Spotlight on the Clubs...

by Betty Lipe

I would like to thank all the clubs that have responded to the questionnaire that I sent via email to 47 clubs and snail mail to another 13. Responses have been coming in weekly. If you have not sent your response in yet, there is still time before the Convention. I would like to put a report together with the information to share with the clubs at the COA Club Rep Breakfast.

From the responses that have come in, I have been able to glean the following community service information. I hope to list your club next time.

Scholarships and grants: Astronaut Trail Shell Club, Bonita Beach Shell Club, St. Petersburg Shell Club.

Library Displays: High Desert Shell Club, Jersey Cape Shell Club and St. Petersburg Shell Club.

Other public exhibits, lectures and volunteers at various museums and marine organizations including schools and libraries: Long Island Shell Club, North Alabama Shell Club, Northern California Malacozoological Club, Palmetto Shell Club, San Antonio Shell club, Southwest Florida Conchologist Society and St. Petersburg Shell Club.

Exhibits given to state parks and marine museums or other institutions: Long Island Shell Club, Pacific Shell Club, and St. Petersburg Shell Club.

Hope this gives your club some ideas, and keep those reports coming in.

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Bylaws Change and A Space Odyssey!

In order to better deal with the growing Walter Sage Fund for grants to malacology, a bylaws change has become necessary. Under current bylaws, only 50% of the funds can be held in fiscal entities that have a penalty for withdrawals. The Sage Fund is increasing to a point that a change is deemed prudent. The following recommendation was passed at the midyear board meeting:

Section B, Chapter 10 (Funds) of the Bylaws is to be deleted in its entirety and Sections C, D, and E to be renumbered B, C, and D. Section C (new Section B) would then be amended to "have a maturity in excess of five years." This change will be voted on at the Annual Meeting during the Louisville Convention.

Other new business, Convention 2001, A Space Odyssey, was approved by the Board of Directors. The convention will be hosted by the Astronaut Trail Shell Club at the Radisson Resort at the Port on Cape Canaveral, FL. Doris Underwood and Bobbi Cordy will co-chair the early July event.

Want a Different Sort of Vacation?

How does Belize sound? Maybe Costa Rica, Honduras, Panama, Ecuador, Peru or southeast Alaska? The Rainforest and Reef Conservation Fund is sponsoring field oriented workshops that focus on natural history, rainforest and marine ecology, conservation, land management, medicinal uses of native plants, local cultures, archaeology and geology. Write: Rainforest and Reef Conservation Fund 501 (c)(3) non-profit, 29 Prospect NE, Suite #8, Grand Rapids, Michigan 49503 USA Phone/Fax: (616) 776-5928 E-mail: rainforest@mail.org

Observations on Some New World Mollusks

by Emilio García

On *Pachycymbiola ferussacii* (Donovan, 1824) — On a recent trip to Argentina, several of us collected specimens of this rare volute in Tierra del Fuego, in a quiet bay with a large expanse of sand exposed at low tide. Although most specimens had been dead for a long time, some were very fresh. A specimen collected by Mr. William Clendenin, of Sarasota, Florida, was in such a good shape it still had periostracum, a characteristic guessed at by Poppe and Goto (1992) but never actually observed.

This population consists of large shells; my largest specimen measures 137 mm. Juvenile specimens develop a heavy parietal callus early on, even though the outer lip is very thin. The callus, although broken, can easily be observed in the 42 mm specimen shown in the photo.



Pachycymbiola ferussacii (Donovan, 1824) Tierra del Fuego, Argentina.

Although Poppe and Goto include the geographical extension of this species only as far south as the Magellan Straits, some twenty-five specimens were collected in this particular bay in Tierra del Fuego. They were more common there than *Adelomelon ancilla* (Lightfoot, 1786). We also saw a good number of specimens in the



Epitonium fabrizioi Pastorino and Penchaszadeh, 1998, Puerto Madryn, Argentina.

stock of Argentine shell dealer Jorge Vázquez, live-collected from Staten Island, just south of Tierra del Fuego. Our finds, in conjunction with those of Mr. Vázquez, seem to indicate that *P. ferussacii* has its center at Tierra del Fuego and its surrounding area, and becomes rarer in more northern latitudes. *P. ferussacii* also seems to be a very shallow water species, at times intertidal.

On *Epitonium fabrizioi* Pastorino and Penchaszadeh, 1998 — On the same trip to Argentina, we collected a number of this newly described species. *E. fabrizioi* looks very much like *E. albidum*; however, under the scanning electron microscope (SEM), the protoconch ornamentation of the two taxa is quite different, and the teleoconch of the latter has a

characteristic pitted microsculpture. Because of the similarity to the naked eye between the two species, it is almost impossible to tell them apart without the SEM.

Upon examining my specimens of *E. fabrizioi*, I noticed that almost all the specimens, fresh and dead collected, had a short, but rather wide subsutural pale-tan band on the dorsal side of the last whorl, best seen when the specimen is wet, and even better from inside the aperture. This characteristic, not mentioned in the original description, puzzled me so I sent three specimens to Dr. Pastorino, who confirmed the identification.

Clench and Turner's (1951) description of *E. albidum* mentions that some specimens may have "a faint subsutural band of yellowish-brown." Since some of the material reviewed by them under *E. "albidum"* came from Argentina, I wonder if these specimens are not *E. fabrizioi*. I have *E. albidum* from the Gulf of Mexico to Brazil, and none of them shows the pale tan band. If my hypothesis is correct, this colored band may be a relatively good diagnosis for *E. fabrizioi* for those collectors who have no access to SEM.



Serpularbis oryzata (Mörch, 1862) Chiriquí Bay, southern Panama, trawled.

On *Serpularbis oryzata* (Mörch, 1862) — Although its southern limit has been published as "Acapulco, Mexico," a specimen of this interesting species measuring over 250 mm was dredged in Chiriquí Bay, southwest Panama in 120-240 ft. *Serpularbis oryzata* grows to the formidable length of 496 mm (Draper, 1987). It is loosely coiled in its early life, while it is attached to a hard surface (Keen, 1971). It soon breaks from the hard substratum, and from then on grows almost straight. The break of the specimen in hand is sealed with a rounded calcareous "plug" from the inside.

On *Olivella gracilis* (Broderip & Sowerby, 1829) — As its name implies, because of its elegant shape, size, and coloration, this species must rank among the most beautiful of the Olivellinae. In a recent trip to Panama we dredged, in some 60 feet of water in southwest Cebaco



Olivella gracilis (Broderip and Sowerby, 1929) Southwest Cebaco Island, Montijo Bay, Panama.

Island, three beautiful large specimens which we placed in an aquarium on board, so we could photograph the animals. Soon after I placed the first *O. gracilis* in the aquarium I saw a big commotion in the water, as though some large animal had fallen inside and was trying to get out. I was half right. The commotion was being created by the *Olivella*, which was swimming up to the surface of the water, foot extended, and then 'swimming' on the surface, at times almost the length of the aquarium! The aquarium was about 12 inches in length with about 4 inches of water. The animal had a shell 27 mm in length and, when it was ready to perform, would widen its foot to about an inch and head for the surface. Once there it would move like a waterfowl does when starting its flight from the water. Whenever the *Olivella* reached a corner of the aquarium, it tried to climb up the wall with its "wings," again, like a fowl trying to get out of the water. We observed the same behaviour in the other specimens. Although many of us have seen *Olivella* and *Agaronia* use a "swimming" behaviour to take advantage of water motion, these *Olivella gracilis* go home with the Oscar for best performance.



Conus cf. aurantius Hwass, 1792, Isla Providencia, Colombia.

28.5 by 13.3 mm and 24.7 by 12 mm. Both have about 7 teleoconch whorls and seem fully grown. This form is characterised by having an elongated body whorl, 23.2 mm and 19.9 mm respectively for the two specimens cited above, which causes them to have rather parallel sides, and by coronations on the spire. All the specimens dredged have the same dark-tan markings. They were dredged in about 40 ft. of water in coral sand and rubble.

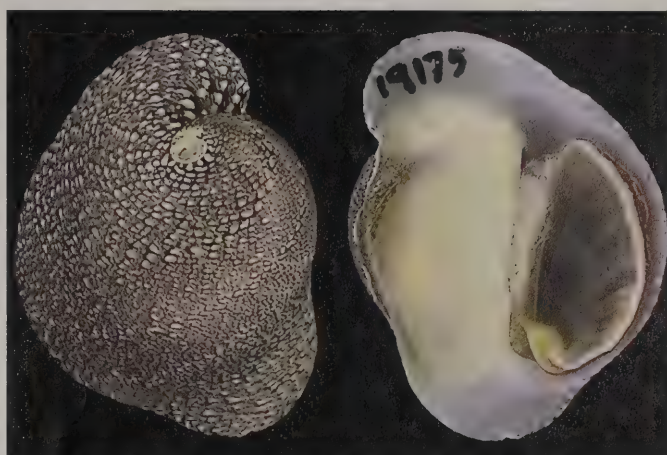
On the genus *Neritina* in Panama — Most collectors of Panamic Province mollusks are acquainted with the bizarre species *Neritina latissima* Broderip, 1833. We have found this species in the small rivers of Gobernadora Island, in southwest Panama. During a recent trip there, we collected an interesting form of *N. latissima* on Cebaco Island, next to Gobernadora. I looked at some thirty specimens of the Cebaco form and none of the adults showed the typically extreme flared lip of *N. latissima*; they were shorter in length, the largest measuring only 22.7 mm, but at the same time many were "higher" when placed aperture down. Also there was a versatility of markings, including pronounced banding and interesting color patterns, a feature lacking in regular populations of *N. latissima*.

On the Caribbean side, near Porto Belo, we obtained *Neritina punc-*

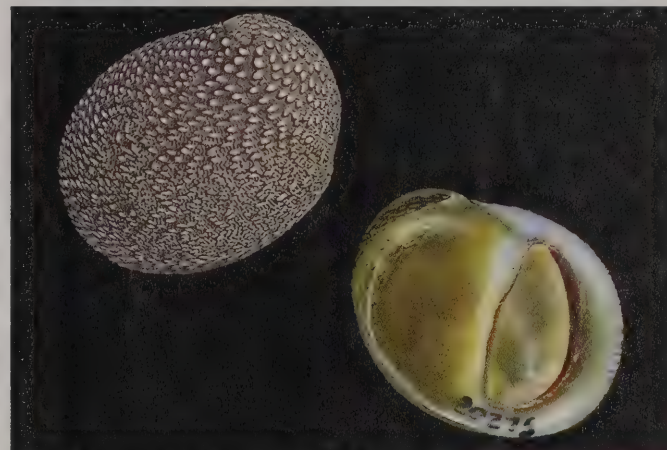
On *Conus cf. aurantius*

Hwass, 1792 — During a visit to Isla Providencia last August, I had the opportunity to dredge around some of its offshore reefs. Isla Providencia, which belongs to Colombia, is off the Caribbean coast of Costa Rica and therefore in a very strategic geographical position for exchange between southern and western Caribbean marine faunas.

Upon my return from Providencia, I catalogued 168 lots from the dredgings and shallow water collecting. This included *Conus flavescens* Sowerby, 1834, *C. spurius* Gmelin, 1791, and *C. mindanus* Hwass, 1792. The most interesting species of cones dredged is a form of the "cedonulli complex" pictured here. It is small; the two largest specimens measure



Neritina latissima Broderip, 1833, Gobernadora Island, Montijo Bay, southern Panama.



Neritina punctulata Lamarck, 1816, near Porto Belo, northern Panama.

Neritina latissima Broderip, 1833, from Cebaco Island, Panama.



tulata Lamarck, 1816, a species that seldom appears in the popular literature of Caribbean mollusca, and is never offered by dealers. The readers may be interested in seeing a picture of it.

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MADAGASCAR, LANDSNAILS, AND A DREAM COME TRUE

by Neil Fahy



A boa "guarding" an empty *Achatina fulica* shell. — Toamasina Province: Andranofosy.

When you were a child, didn't you always want to go on a scientific expedition to a far away place? Well, I did. My opportunity to be a landsnail collector on the Biodiversity Research and Information Project of the California Academy of Sciences (CAS) to Madagascar was like a dream come true. Madagascar is an island time forgot. It has a unique fauna of lemurs, chameleons, and giant snails that lay eggs almost the size of a chicken egg. My contribution to the expedition was twofold: prepare a landsnail inventory of Ranomafana National Park and a popular field guide to the park's snails intended for the use of the local nature guides. At present the spectacular landsnails are the forgotten fauna of the park. Using the guide will help the ecotourist include the remarkable snails in his Ranomafana experience.

The month long research project was preceded by a three week CAS tour which covered the northeast, central, western, and southern parts of the island—a great overview. The areas visited were examples of the varied habitats of Madagascar.

The Malagasy people are a mix of Indonesian (Borneo) and African. The African influence was probably from a later immigration. It isn't entirely certain that some Africans didn't come along with the Indonesians when they were on the African mainland. The people speak Malagasy, French, and some English. We think we are commu-



Ampelita watersi has a dark colored foot. (42.2mm) — Fianarantsoa Province: Berenty.

nicated but there are some translation deficiencies. One day in the forest I went on ahead. Frank said he hoped I didn't get lost. Our guide Rina said, "Neil can't get lost; he has a name tag."

The first area we visited was the eastern rainforest at Ranomafana. The ride from the capital of Antananarivo (shortened to Tana) across the central highlands was an opportunity to see villages and rice fields. The highland houses, made of local bricks, are one room wide and two stories high. They reminded me of Monopoly hotel pieces. Rice terraces are everywhere. With 65% of the population less than 17 years old, there are many young mouths to feed. This is accomplished by cutting and burning the vegetation and terracing the slopes.



Edentulina ovoidea is probably an introduced carnivore. — Fianarantsoa Province: Ranomafana National Park.

Ranomafana National Park is a forest oasis in a denuded landscape. Forest remnants are rare in a land of slash and burn. The leafless tree snags on the hill crests look like a picture of the "End of Eden." Madagascar is literally being burned up—an island on fire. The park, an old second growth forest, is best known for its twelve species of lemur. Its snails are pretty good too. We visited the lemur sites and along the way I watched for snails. This park was the center for our research project after the CAS tour.

We next drove across the island to Tulear on the west coast. The countryside became more arid as we traveled westward. We spent a couple of days at Isalo National Park. This arid deciduous forest region is located on exposed horizontal sandstone and is a dramatic change from the eastern rainforest. It was the dry season and I did not see any snails, not even empty shells from last year.

The arid area north of Tulear has a baobab forest. I'd seen baobab trees in Africa but they were single isolated trees. Here there were many trees in a spiny forest. There is one species of baobab in Australia, one in Africa, and seven in Madagascar (including the



A thin-shelled *Helicophanta* egg, 32.4 x 26.0 mm — Fianarantsoa Province: Ranomafana National Park.

African species). Recent evidence suggests that the Australian species got there by long distance dispersal. This southern hemisphere distribution pattern suggests a common Gondwanaland origin, but long-distance dispersal is also a distinct possibility.



Helicophanta farafanga showing the spiral bands and colored foot. — Fianarantsoa Province: Ranomafana National Park.

We flew (it would have been a week's trip by car) from Tulear to the southeast coast at Tolagnaro (Fort Dauphin) located on a small peninsula bordered on three sides by beaches. A two hour ride west is the private reserve of Berenty. Our short stop at the Three-cornered Palm Reserve seemed an unlikely place to look for landsnails. The soil was sandy and well drained. The vegetation was spiny or with small leaves. The temperature was in the 90s and the annual rainfall was low. Imagine my surprise when I found many shells on the ground. They were not small shells but were heavy shells of three to four inches' length. The genera represented were the tall *Clavator* and *Leucotaenius* and the wide *Ampelita*, *Helicophanta*, and equidimensional *Tropidophora*. These genera are all Madagascar endemics except *Tropidophora*.

Many of the dead *Tropidophora* shells contained the operculum in the aperture. There is no remnant of the animal and in most cases the body whorl was filled with sand. Is this an indication they died during aestivation? Is aestivation mortality a natural population control?

In the northeast we visited the wettest area on our trip, Maroantsetra, at the head of Antongil Bay. The disturbed and second growth forest yielded only the introduced *Achatina* and *Bradybaena*. In the early evening and the early morning following a light rain there



The pattern of the retracted foot of *Helicophanta farafanga* is unusual. — Fianarantsoa Province: Ranomafana National Park.

were three-inch yellow-green slugs crawling on the wooden bungalow rails. These had three white longitudinal lines on the top and sides of the foot. The location of the mantle in the anterior half of the foot and the mid-body to posterior pneumostome suggest it is a member of the African family Urocyclidae which has six Madagascar species in the genus *Urocyclus*.

On a walk from the lodge to the beach, I found a live four inch *Achatina fulica* on a skull. The next day I saw another *Achatina fulica* on a dead nautilus shell. Are the snails looking for an easy calcium source?

On the island of Nosy Mangabe in Antongil Bay, *Achatina fulica* was seen at the camping area while *Ampelita guadens* and *Helicophanta amphibulima* were found along the coastal trail. Our last stop with the tour was at Perinet where we saw the largest species of lemur, the Indri. Perinet, like Ranomafana, is a remnant of the upland rainforest. The big difference is that Perinet is being invaded by introduced Eucalyptus, pine, and ecotourism.

We walked in the forest and saw and heard the Indri. They were in the tree tops giving their territorial call which can be heard for a mile. As the morning progressed, they descended the trees to about six feet above ground. There are no monkeys in Madagascar. Their niche is filled by the lemur. The lemurs are opportunist vegetarians and can make long leaps from tree to tree without a tail for balancing. They are very docile and have no fear of the people on the ground beneath them. They have black faces and white bodies, and are about three feet tall. They look like a koala or a panda gone wrong.



Helicophanta ibaraoensis has multiple narrow spiral bands with several darker bands above the periphery. — Fianarantsoa Province: Ranomafana National Park.

A couple of problems at Perinet: first are the number of visitors at one time. There were fifty tourists plus five guides under a single Indri family. All the forest growth was trampled. Ecotourism is good but it should be controlled. Second, and more threatening, is the invasion and replacement of the native vegetation by exotics. In the Indri area there is a large stand of Mexican pine shedding needles everywhere. The *Eucalyptus robusta* is also an intruder. When these trees dominate the forest, the Indri will die from starvation. A program to control the exotics is needed now. The over-attendance of visitors prevents native seedlings from germinating.

When we returned to Tana, the tour ended and my fellow travelers returned home. I remained and was joined the next day by the research team. The CAS expedition consisted of four botanists, two entomologists, three photographers, and me. A typical camp day started at 5:30 or 6:00 a.m. when I went to the lab to finish up cataloging yesterday's catch. Breakfast at 6:30 consisted of bread, peanut butter, and jam. Left for a collecting trip about 7:30 and returned 11:30. Lunch consisted of rice and beans with bananas for dessert. We must be careful eating the rice because of the gravel included with it. About 2:30 to

3:00 we left for another collecting trip, returning about 4:30 or 5:00. Dinner at 6:30 consisted of rice and no beans. Sometimes we had range chicken. Someone said the range chickens were so skinny they died from starvation. They were meatless. If we were really lucky, we got pasta or spaghetti which was nice to eat because you didn't have to check for gravel. We returned to the lab after dinner and went to bed at 8:00 or 8:30.

We had one-man waterproof pup tents with a tarp under the tent, one inside as a floor, and a huge tarp overhead as additional rain protection. Our tent area was about 200 yards from the toilets and cold showers—down to the river and across the bridge. It was downhill to get there but the tent sites were level. It was a workout for an old man, but fortunately, I still move faster than the snails.



Trophidophora tricarinata bicarinata with a greenish color. — Fianarantsoa Province: Ranomafana National Park.

The lab consisted of a large room with a small storage area. The dining building had a large study room (also used for dining), a kitchen, and a large outdoor porch with a long dining table. The cooking was done over an open fire outdoors behind the kitchen. The research facility is operated by the Institute for the Conservation of Tropical Environments (ICTE) with offices in Stony Brook, New York and Tana. They secured our collecting and export permits.

The park has many well marked trails with lots of ups and downs. The trails are designated with letters and are marked every fifty meters with a sign giving the trail name and the distance in meters from the start of the trail. This was very useful for recording collecting locality data. The park has three study sites, Talatakely, Vatoharanana, and Vohiparara. Talatakely is where we stayed and is the most visited, especially by tourists. Vatoharanana is south of Talatakely and is the most remote. Vohiparara is north of the Ranomafana road and is called "primary forest" but is very disturbed second growth. I did not visit Vatoharanana because it was a tough two hour hike for people in good physical shape. The botanists, using porters, went for two nights. I did not want to push my luck.

The FF trail to Sakaroa Falls was a very pleasant hike. The upper waterfall is about sixty feet high and cascades over a rock cliff into a pool at the base. It is a trail I frequently took because of its varied habitats. Along the trail near the fall I found a three inch slug whose mantle entirely covered the foot. It was *Vaginula* in the Veronicellidae.

On one trail we came upon a group of spirit monuments. The native people believe that when a person dies, the spirit is released from the body by the killing of a zebu. The freed spirit then goes to the forest looking for a resting place. The body resides in the family tomb, and the spirit at the memorial site in the forest. The height of the vertical stone memorial columns indicates the height of the deceased.

One day we left Ranomafana and visited Mt. Vatovavy. We left at

5:15 a.m. and drove east two hours to Ambolotara, where we stopped to get access permission and guides. Vatovavy is an imposing rock remnant of 572 meters rising from an elevation of 200 meters. We needed permission because the mountain is sacred. The chief was working in a field so we were given permission by an elder. We hired two guides at 15,000 Mf (\$3) each, drove a short way east and parked the car.



Urocyclus has the mantle on the anterior third of the foot. — Toamasina Province: Maroantsetra.

The trail is well maintained because it goes up to a family tomb below the peak. The trail is in good condition all the way to the top. The trail from the road to the tomb is through disturbed vegetation. Beyond the tomb it is still disturbed but there are a few trees. At about 350 meters the primary forest begins. This is the most spectacular forest we had seen so far and the only primary forest. The trail circles the promontory counterclockwise at the base of vertical cliffs. The rock looks like a gneiss with limestone inclusions. It was a great forest with great snail collecting, especially operculates. We ate a quick dinner in Ranomafana and arrived back in camp at 8:30 p.m. It was a long but wonderful day.



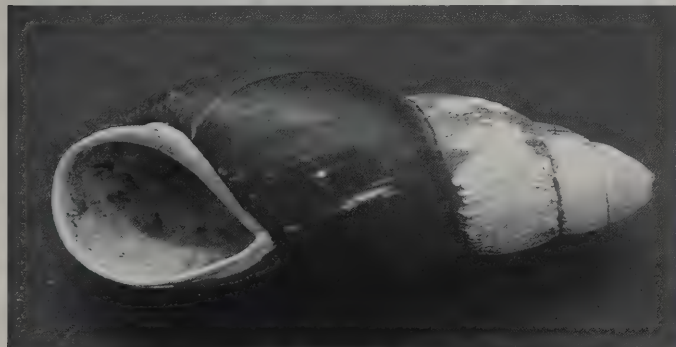
The tail of Parson's chameleon is trying to resemble a snail.

The species collected at Vatovavy were related to the amount of disturbance. From the road to the tomb I found *Achatina fulica* and three other species; from the tomb to the primary forest four species and no *Achatina*; and in the primary forest nine species and *Achatina* only on the disturbed summit. The primary forest was a very species-rich locality with five species of *Trophidophora*, one *Ampelita*, two *Helicophanta*, and one *Macrochlamys* plus *Achatina fulica*.

The operculate *Trophidophora tricarinata subdyganoides* is heli-form and has a narrow white band on the periphery with raised bands above and below. A depressed form with similar markings was also

found. It was not described in the literature. Could it be sexual dimorphism in *T. T. subdyganoides*? In the male and female *Tropidophora* illustrated, the dimorphism is related to size (females larger than males), not to shell shape. Since I have alcohol specimens of both "forms," it should be easy for someone else (I don't dissect) to determine if it is sexual dimorphism or a different species.

Vatovavy differs from Ranomafana in habitat. Vatovavy is in the eastern low (200-570 meter) rainforest and Ranomafana is in the eastern upland (850-1170 meters) rainforest. This difference is illustrated by the increase of *Tropidophora* from two species at Ranomafana to five at Vatovavy.



Clavator eximius was not found live. (87.8 mm) — Fianarantsoa Province: Ranomafana National Park.

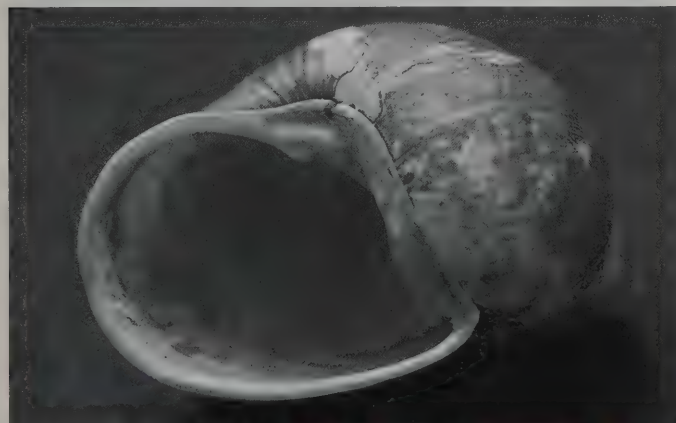
THE SNAIL FAUNA

Now let's look at the snail fauna. There are two major subclasses of land snails. These are the Prosobranchs and the Pulmonata. They are easy to tell apart. The Prosobranchs only have a single set of tentacles, the eye is located at the base of the tentacle, there is a door called an operculum which can seal the animal within the shell, they breathe by gills, and the sexes are in separate animals. The Prosobranchs are often referred to as Operculates. The Pulmonates have two sets of tentacles, the eyes are at the tip of the upper pair of tentacles, there is no operculum, they breathe by lungs, and both sexes are present in the same individual (hermaphrodites).

The landsnail fauna of Madagascar is remarkable in the large size of the species and the high percentage of endemics. The major families seen were:

POMATIASIDAE

In contrast with Africa having a paucity of operculate landsnails, Madagascar has two genera and an abundance of species, especially in the genus *Tropidophora*. This is almost an endemic genus. It also occurs in the Comoros, Seychelles, and southeastern Africa. The genus has 89 species of which 87 are endemic to Madagascar.



Helicophanta amphibulina showing the projection on the columella. (54.8 mm). — Toamasina Province: Maroantsetra.

ACHATINIDAE

This family which is so well represented in Africa is only represented in Madagascar by one genus with two introduced species, the abundant *Achatina fulica* and the rarely seen *A. emarginata* with a pink columella.

STREPTAXIDAE

This is a predaceous family widely distributed in the Old World tropics, including India, China, and southeast Asia. *Edentulina ovoidea* is possibly not a Madagascar native but may have been introduced from Mayotte to control the introduced *Achatina*. *Gulella andreana* has a small pupilliform shell.

ACAVIDAE

This is a Madagascar endemic family of five genera and many species. It includes the largest individuals to be found in Madagascar. The four genera I collected are *Ampelita*, *Clavator*, *Helicophanta*, and *Leucotaenius*.

Ampelita is a genus with a large umbilicate depressed shell and 67 species. The depressed shell and flared aperture lip make it easy to recognize. Instead of lifting its shell when it moves, it rests the shell on its tail and crawls in a continuous smooth glide.

Clavator with eleven species has a large fusiform shell with a reflexed lip. *Clavator* does not rest its shell on its tail but drags it in a rhythmic hitching motion.

Helicophanta, with 11 species, is the most conspicuous genus. The shells are large, depressed or bulimoid, and abundant. The depressed species have a protoconch 1/3 the diameter of the shell and are hatched from an egg almost the size of a chicken egg. The egg I found was 33 by 26 mm. The South American *Strophocheilus popelairians* has an egg up to 51 mm, which is the largest known egg of any living terrestrial mollusk! *Helicophanta* also carries its shell on its tail and its movement is similar to *Ampelita*.



Helicophanta souverbiana audiberti with a single wide band; Fianarantsoa Province: Ranomafana National Park. — Fianarantsoa Province: Ranomafana National Park.

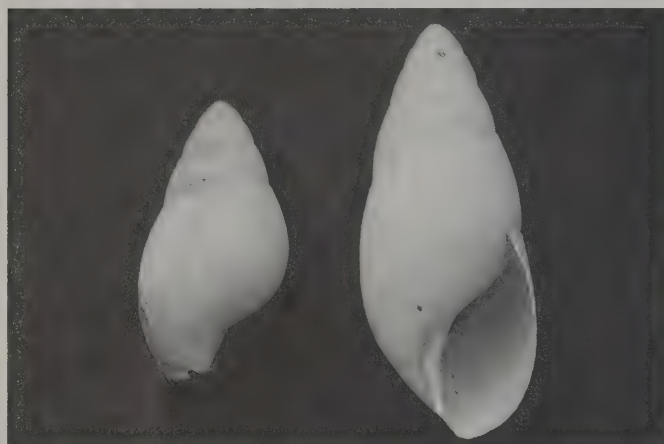
The original 1860 description of *Helicophanta souverbiana* described it as having 4-5 broad dark spiral bands. I only saw one broken dead shell fitting that description and that was at Perinet. None were seen at Ranomafana. The species with one band has been called the subspecies *audiberti*. The specimens with two wide bands are not mentioned or illustrated in the literature. Is it a new species or subspecies? It is not the two banded *H. bicingulata* because *bicingulata* has many narrow bands with a darker band on the periphery and a darker one above.

Helicophanta ibaraoensis has multiple narrow bands above and below the periphery. Five of the bands above the periphery are darker. *Helicophanta souverbiana audiberti* and the one with two wide dark bands both are imperforate and have a yellow-brown colored animal.

The depressed *Helicophanta* forage on the ground where they are especially fond of mushrooms. They rest for a week or so in a tree or shrub, usually at a height of three meters. It is startling to see a large snail crawling on the thin stem of a plant. Why do they ascend trees to rest? Why not conserve energy and rest on the ground? They may find it cooler a few feet above the ground. Since leeches suck the blood of invertebrates as well as vertebrates, could leaving the ground escape leech or tenrec (a small insectivore) predation? OR do they climb the trees during dry weather to take advantage of the morning mist as it runs down the stem? *Helicophanta* are on the stems, not on leaf branches.

I collected three tall *Helicostyla* species—at Maroantsetra, *H. amphibulima* and *H. goudotiana*; at Ranomafana, *H. farafang*; *H. amphibulima* and *H. goudotiana* are very similar except *H. amphibulima* has a "tooth" on the columella. *H. farafanga* is huge, reaching almost 100 mm and has several wide spiral bands.

H. leucotaenius has a large bulimoid shell and seven species. It is an endemic genus which in 1985 was moved from the family



Leucotaenius adami was found in the spiny forest. — Toliara Province: Berenty.

Achatinidae to Acaidae based on an anatomical study.

RHYTIDIDAE

The family is carnivorous and is found in Australia, New Zealand, the South Pacific Islands, and Southern Africa. "*Rhytida*" *covani* has been tentatively placed in the genus *Rhytida*. It was included with the *Ampelita* but is definitely distinguished from that genus by its straight lip. If it truly belongs in the Rhytididae, it will be the sole representative of that family in Madagascar. The family is present in southeastern Africa and the Seychelles; consequently, it is not surprising to see it in Madagascar.

ARIOPHANTIDAE

The tropical family is widespread and has a medium to large shell which is usually narrowly umbilicate or perforate. *Kalidos*, with seventy-one species, is endemic. It has a medium-to-large, depressed-to-helicoid, perforate shell with a straight lip. It also often has an angled periphery outline. I saw two species. *Macrochlamys* has one medium size depressed species which is also present in the Comores.

BRADYBAENIDAE

Bradybaenidae is a family with many species in southeast Asia and the Philippines. The only species in Madagascar is *Bradybaena similis* which has been introduced throughout the tropics. It is referred to as a "tropical tramp." It has been suggested they were distributed throughout the tropics in the soil adhering to coffee plants.



Macrochlamys stumptzi has a dark body. — Fianarantsoa Province: Ranomafana National Park.

THOUGHTS AND QUESTIONS

Why was there a lack of tree snails? I would have expected some in the tropical rainforest. Why weren't any brightly colored snails present? The fauna was unicolor or with dull patterns. The family Achatinidae is native to Africa and the Mauritius. Why are there no native Achatinidae in Madagascar, yet it is found to the west in Africa and to the east in Mauritius? Could it originally have been present, but since replaced by other species? The landsnails are not eaten by the natives but freshwater species which are host to the liver fluke are. Maybe it's good the landsnails have not been eaten because *Helicophanta* and the other large species would have been exterminated. The number of live individuals seen was directly proportional to the humidity and rainfall. During the twenty-four research days at Ranomafana, it rained on 3 occasions. Immediately following the rain live individuals, especially *Helicophanta*, were abundant.

SUMMARY

During the trip I collected 39 landsnail taxa, excluding marine and freshwater, but including 3 introduced (*Achatina*, *Bradybaena*, and *Subulina*). I visited three especially rich landsnail habitats. The first was the old second growth upland rainforest at Ranomafana National Park where I spent 24 days and collected 15 species. The second was the primary forest at Vatovavy where in 5 hours I collected 9 species. The third was the arid spiny forest east of Berenty where in two days I collected 8 species. I would like to see the spiny forest after one of its infrequent rains. The landsnail activity must be awesome. The highlight of the trip was to be a part of a scientific expedition — a dream come true and the experience of a lifetime.



Is this a new *Trophidophora* species? The left specimen has a height of 20.9 and a width of 29.3mm. — Fianarantsoa Province: Ranomafana National Park.

BOOK REVIEWS

A Natural History of Shells by Geerat J. Vermeij. Princeton, NJ: Princeton University Press (Princeton Science Library), 1993. (110 black & white photos and figures, 22 color plates, 207 pages, hardback - \$50.00, paperback - \$18.00).

Privileged Hands: A Scientific Life by Geerat J. Vermeij. New York: W. H. Freeman, 1997. (14 black and white photos and figures, 297 pages, hardback - \$24.00, paperback - \$15.00).

A few months ago, I had the good fortune to read for the first time Vermeij's *Natural History of Shells*. Rather than being a standard identification work on shells, this book explores the near-miraculous adaptations of shells (chiefly, but not exclusively, molluscan) and the animals that build and live in them. In the book, he explores such questions as: What rules govern the growth of shells? How does the animal maintain a calcareous shell in an environment that is continuously trying to dissolve calcium carbonate? How do shells enable the animal to avoid sinking in soft mud or burrow quickly in sand?

Two lines of research are particularly important to Vermeij. The first major line of research involves correlation of the structure of intertidal species around the world. He notes that, in all parts of the world, nerites are generally more spherical and more strongly ribbed, while littorinids are generally higher and more nodulose in the upper parts of the intertidal than those lower in the habitat. Among other things, the globular design of the nerites permits them to maintain a store of water, while the taller shell enables the littorinids to minimize exposure to the sun, both adaptations to avoid desiccation in the harsh upper intertidal.

The other chief line of Vermeij's research is the interaction between mollusks and their predators. Rather than tossing away those broken specimens, Vermeij realized they can tell us a great deal about the forces of natural selection acting on mollusks. Repaired breaks tell us the individual survived an attack by a predator and lived, possibly to reproduce. He examines the claws of crabs, dividing them into crushers and peelers, and then looks at their prey and the adaptations of the shells to reduce predation. He found crab predation to be most intense in the Indo-Pacific region, which gave rise to crabs with tremendously powerful crushers and shells with such dense armament as *Drupa morum*. While fortification is one method of resisting predation, "running" is yet another. The heavy shell is a literal burden, so shells with swift predators often have lighter shells.

In *Privileged Hands*, his autobiography, Vermeij describes his childhood in Holland, adolescence in New Jersey, and scientific career. Young Geerat ("Gary") lost both eyes to juvenile glaucoma at age four. Handling some shells brought back from Florida by his fourth grade teacher, Vermeij found a calling that determined the course of his life. The question that occurred to him that day, and which he has not yet sufficiently answered, was, why are the shells from Florida so much more substantial and less chalky than those of his boyhood beaches of Holland?

Denied the benefit of sight, Vermeij is still able to identify most shells to genus and often to species, as he demonstrates in the chapter "The olive and the harp." Vermeij was fortunate to have supportive parents and to avoid the classic horror stories of schools for the blind. If he encountered resistance, he does not dwell on it. He received his undergraduate degree from Princeton and his doctorate (in near-record time) from Yale, both in paleontology, then went on to teach at the University of Maryland and later at the University of California at Davis.

His researches have taken him to all parts of the world, collecting, observing, and questioning. *Privileged Hands* is sprinkled with encounters with most of the important names in evolutionary theory today, either as fellow students or as mentors. Vermeij does not avoid controversy. In *Privileged Hands*, he tells of his strong views on punctuated equilibrium and adaptationism, two strongly divisive themes in the study of evolution over the last couple decades. He speaks on the value of museums and collections. Much of his research on shell breakage and predation could not have been conducted without the extensive collections of museums.

Finally, Vermeij speaks on activism for and by the blind. He strongly feels that the blind must compete in a sighted world, and demonstrates that they can compete successfully, given reasonable accommodation. One current politically correct term for "handicapped" is "differently able." Nowhere is that term more appropriate than for Geerat Vermeij. I heartily recommend both books to all persons interested in shells or any aspect of nature. Vermeij has much to teach us about our hobbies and about ourselves.

—Bruce Neville

First published in High Desert Shell Club Newsletter

V. 1 No. 1 April 1999. Ed. Tom Eichhorst.

The Pulchra Complex - Revision of Cymbiola (Cymbiolacca) from East Australian Coast by Patrice Bail and Allan Limpus. January 1999, 79 p., 210 x 295 mm, 266 colour photos, 3 maps, 1 diagram, soft cover, ISBN 88 8299 001 X Published by Evolver SRL, Rome, Italy. Italian and French versions of the text available from the publisher on request. Available from: Evolver SRL, Via C. Federici, 1. 00147 Roma, Italy US\$35 Capricornia Publications, P.O. Box 345, Lindfield NSW 2070, Australia. AUS\$58.50

This nice-looking publication will appeal to collectors of the popular Volute family. The *Cymbiolacca pulchra* complex has long been Allan Limpus' interest. Because he lives in the area where these Volutes are found, he has built an amazing collection of them, obtaining them from trawlers and through exchange for many, many years. If anyone knows about these shells, it is certainly Alan.

In the book, the authors set out to explain the differences among fourteen existing and two new taxa in the *Cymbiolacca pulchra* complex, which consists of groups that are distinctly separated in distribution. In this task, the authors have certainly succeeded. I know very little about Volutes, nor am I particularly interested in them, but I had little difficulty in identifying the various subspecies I possess. The book is illustrated with an abundance of beautiful photographs, illustrating their variability and differences among subspecies. This, I think will prove to be the book's major asset. Also, the three maps are very useful.

I think more attention could have been devoted to the text. Descriptions are generally good, but the quality of English is patchy. Parts were obviously written by Allan, but you may still find beauties like this: 'The geographically recognizable border of the species expresses the compromise between the efforts of local adaptation with the whole genetic pool of the species and its homeostatic constraints' (p. 5). This piece of text lost me completely. Although non-English speaking authors may be excused for their lapses, the publisher should not perpetuate their mistakes. I am told that there was a review process involving an English-speaking editor; having done this type of work, I know that 'editorial fatigue' may set in with a particularly difficult piece of text, so it would be a good idea for the publisher to bring in somebody fresh to iron out the final glitches.

But it would have taken another Australian to pick up the embarrassing misspelling of the new subspecies *C. pulchra frazerensis*. Named after Fraser Island, this should of course have been spelt with an 's'! I also feel that a publication like this deserves a slightly thicker cover. We were promised hard cover, but this is more like a magazine cover. I also note that the publisher's address is not in the book. In all, I think it is a worthwhile publication for those interested in Volutes. It certainly makes identifying those dreaded 'pulchras' from off the Queensland coast much easier.

—Patty Jansen

Have You Got What It Takes... To Be An Author?

by Patty Jansen

You are considered an authority on a particular family, or you have noticed that there are no recent books on shells from your particular area. Then someone says, "Why don't you write a book?" Well, why not? So you start collecting data, and writing it all down, and taking photographs, visiting museums, and collating a nice book, sticking bits of text together with photographs, until you have a manuscript of 400 hand-typed pages, in double spacing, because you've heard publishers want it that way. When it's finished, you try to find someone to publish it. But oh dear, the publishers whose addresses you found in the yellow pages don't seem to be one bit interested, even though you have spent hours in the local library making expensive photocopies of your work, some are so rude they don't even acknowledge receipt of your manuscript. Your friends were so encouraging, and now you've hit the wall. You lose interest, and eventually your beautiful manuscript disappears into a box in the cupboard. You are disillusioned and writing books is the last thing you want to ever hear about. Sound familiar? Well, it needn't be that way.

OK, let's take a few steps back in time, a few years probably. You are considered an authority on the Mitridae of the world, for example. You have an archive of material, assembled from your own collection, museum visits in your own country and trips overseas, and are up-to-date with the latest taxonomy. You want to write a book, but you haven't the faintest clue where to start. Here we will discuss the process you need to go through:

Books published by a third party

Who is going to buy it?—Before you even put one letter on paper, imagine your book as a finished product. Now, who is going to buy it? Think of your friends. Who among them would buy such a book (not knowing it was written by you)? Who in your local shell club would buy it? Who in the world would buy it? Be honest with yourself.

The Mitridae are quite a popular family, so you will probably consider the project worth pursuing. If your interest is a very obscure family, you might decide otherwise. I will say a few things about conventionally "un-publishable" manuscripts later.

Finding a publisher—The worst thing about books is they have to be published. Printing and preparation for print costs a lot. A publisher will do the work and take this financial risk on your behalf because he thinks he can make money out of selling your book. Shell books are generally not big money spinners. The market is too small and too fragmented for your average publisher to be interested. You have to be an insider to know where and how to sell shell books; the normal channels do not work. A few publishers have burnt their fingers, so are not interested. So who will publish your book? An insider! There are a number of specialised shell book publishers around the world, or for a book about local shells, you may find a small local publisher.

So hey, before you've even written a word we are already talking about finding a publisher! And that is the way you should do it. Serious writing is not worth it until you find someone interested in publishing the book. Also it is good to know before you start writing what format the book will take. If your text is going to face the plates, it will have to be brief. If it appears the book will not be in colour, it may be better to include black and white drawings of small shells (so you've wasted all this time trying to photograph them!)

Preparing the material—So now that you've found someone who wants to publish your book, you can start writing in earnest. There are a number of ways in which you can make this task easier for yourself, and maintain the good relationship between yourself and your publisher. You absolutely MUST use a computer. If you don't have one, get someone else to type your material, but better still, buy a computer and learn how to use it.

Use a fixed format for your descriptions, and stick to it. For example, for each species use the headings 'description' 'size' 'distribution' 'habitat'. Make all descriptions more or less of similar length, and provide similar information for each species. Whatever you do, be consistent, in your spelling, use of words, abbreviations and jargon.

When you have finished writing, go through your text with a big red pen, and try to cross out about half of what you have written without changing the meaning of the text. This may be hard or even impossible, if you are not very wordy, but try anyway. Save the 'bits-and-pieces,' the introduction, glossary, index, reference list, for last.

If the book is going to contain photographs, make sure they are the best you can get. If you can't do it, get someone else to take them. It's worth it. If you are going to take your own pictures, make sure all photographs are taken under similar lighting, preferably artificial lighting (since this is less variable). Slide film has a higher resolution, allowing greater enlargement capability. If you use prints, don't cut them out and stick them on a piece of cardboard! There are much better ways of doing this, ways that save you a lot of work, and some blisters!

Going to print—So you have finished your work, and given the whole kaboodle to the publisher. Don't ever expect not to see it back! It is the publisher's job to tear it apart, pick over it again and again, and to make those darn descriptions fit in the spaces allocated for them! You will not like it, but he will tell you to expand this, and shorten that, just because it looks better, or doesn't fit any other way.

If you think your relationship with your publisher is already strained at this point, wait until the subject of payment raises its ugly head. There are two sides to this. You think you should be fairly rewarded for your work. The publisher has started to get his first bills for the project, and because you wanted another four colour plates, he is feeling the pinch. Did I say somewhere there is no money in shell books? OK, in conventional publishing, the author either sells his rights to the publisher for an agreed amount, or receives a percentage of sales. This is often anywhere between 7 - 10% of the recommended retail price of the book. Because of the exclusive nature of shell books, all sorts of interesting deals have been struck between authors and publishers. You could, for example, agree to buy some stock at a distributor's rate (60% off the recommended retail price). You are then free to sell the book, for the recommended retail price of course, to all your contacts. Or you could agree to sell it in your country if the publisher is overseas. One thing you should never forget. To see your book printed and bound is for you, the author, the end of a journey. For your publisher, it is just the beginning. Therefore, it is important that if your publisher so requests, you give him all relevant information as to where he might be able to advertise the book. After all, if the book sells well, he will want to publish something else on shells.

Before I go to the next subject, one more word on publishers. I regularly visit a remainder bookdealer. They have two huge warehouses, where they collect books from all types of publishers who want to dump their stock. Books are being sold for absolutely ridiculous prices. Row upon row of shelves with boxes, each contain someone's dream come true, now being sold for little more than the paper value. Brings a tear to the eye when you look at it that way. Good, so you don't want your books to end up being dumped on the general market! Most large publishers will dump their stock of books that don't sell well. And shell books don't sell well by their standards. They don't recognise that a shell book will remain relevant for at least 10 years, and they don't want to warehouse it for that length of time. So the book ends up in bargain bookstores, and when it's gone, it's gone. The publisher does not want to reprint (it didn't sell, did it?), yet there is a continuous demand. Choose your publisher well!

Self-publishing

After your initial assessment, you decide that you are going to have a crack at it yourself, because nobody was really interested, you don't want anyone else involved, or you feel like a challenge. Self-publishing can be fun, but it can also mean a lot of extra work. Here are a few

steps to make it a successful venture.

The format—Think of a few different formats for your book. Consider size, number of pages, plates (colour or b/w? and placement in the book), type of cover, binding, number of copies to be printed.

The Printer—Find a printer before you do too much work, a local one, or one with a local representative. He will answer your questions and help if needed. Ask for quotes for your options. If two or more printers' quotes are similar, go with the one who was the most prompt and keen in answering your query. Always ask the printer how he wants your material—on paper or on disk. What gives the best results? What format does it need to be in? What is cheaper?

Setting your price—When you know the printer's approximate charges, divide by the number of copies to be printed, and multiply by three. That should give you your approximate recommended retail price. Too expensive? Go back to 1. Why three? I'll explain later.

Get some training in text design—There are some really good and simple guides for text design. Although they won't turn you into a professional, you will never look at text in the same way again. Text layout is best done with a computer. Using an ordinary word processor, you will probably have to physically print your text before you give it to the printer. This means you need a good laser printer. You may also want to use a professional desktop publishing program, such as Pagemaker or QuarkXpress. Three warnings about these: 1. Use only the latest versions (because that is what your printer will use) 2. They have a very steep learning curve, so you may need some training (always consult with your printer about how to set up pages) 3. Why are these darn programs so EXPENSIVE!? In any case, if you use these, you may be able to just give your printer a disk (well, you first better buy a zip drive, too), and they can then use their ultra-expensive, ultra high resolution printer to print your text professionally. Sound like the way to go? Better increase your computer budget!

Advertising: Once you have given your material to the printer, he will take a few weeks to complete the printing. This is the time to get your advertising out. You should by now have collected names and addresses of potential buyers and magazines. Don't forget bookshops, library suppliers and international booksellers, especially if you don't plan to go into accepting credit cards. In some countries this costs a lot of money, but if you really want to sell the book, that is probably worth it; after all, you are now a publisher, and no longer a non-profit organisation.

Selling a book worth \$30 a pop may do quite a bit to your bank balance (in either direction). Talk to your accountant about the fiscal implications (just as well you kept the receipt when you bought that new computer).

The book trade—There is this nasty thing called the book trade. It demands that everybody get a slice of the action. Booksellers and

library suppliers demand 30 - 40% off the recommended retail price. Bookshops won't touch it unless they get 40%. Chain stores and distributors who buy large quantities want even more. The standard rate for a distributor is 60%. They often take stock and pay for it only when they get paid. Bookshops ask for 'sale or return' i.e. they can return the book when it doesn't sell. You can, of course, distribute your own book, but bookstores don't generally stock a book until you go and talk to the manager and hold the book under his nose, and there are only so many hours outside your daytime job, and your family is sick of the project already. So remember about the times three multiplication?

Also, if you are really serious, you will need a fax machine, and an E-mail address. Of course, all this costs money, and once you have set up this infrastructure you may as well become a bookseller. That's how I got started. But it's not too kind on your day time job, and a lot of work, too, so you may rethink this option and go back to A and find someone else to publish it. After all, let's be honest, I could do without any additional competitors.

'Unpublishable' manuscripts

If you are interested in some obscure family, and you have enough data to write a book, but feel no one would buy it and it is not worth publishing in the conventional way, there are still a number of options to get your information out into the world:

You could consider writing a series of articles in a magazine, or maybe they'd like to dedicate a special issue to your work?

How about electronic publishing? It doesn't cost anything. Write your project in HTML code and put it on the internet, or put it on CDROM. CDROM writers are getting cheaper every day; you could produce CDROMs on demand, and never be stuck with any stock.

Remember Tom Rice? He produces these lists we all use, and then just photocopies them. You can do that, too. It works particularly well for texts with black and white line drawings, although you could also include colour photocopies (remember that inkjet printer colour ink fades seriously with age), or just stick in actual photographs.

There are lots of innovative ways to make your material accessible to others. Maybe, after you've printed and photocopied 100 copies of your work and there is no lessening of demand, you decide that you were wrong, and it would have been worth publishing. Then you can always go back to A.

The most important thing, I think, is that when somebody has done a lot of work on a family, this work becomes accessible to others, and the work doesn't die with you, because in one way or the other, we all rely on people who have studied families in more detail than ourselves, to properly identify our shells.

How Many Species of the Landsnail Genus *Otala* Managed to Settle in North America?

by Henk K. Mienis

Landsnails of the genus *Otala* Schumacher, 1817 (Fam. Helicidae) are confined in their distribution to SW Europe and NW Africa. The two European species: *Otala lactea* (Müller, 1774) and *Otala punctata* (Müller, 1774) are well known and have been adequately illustrated by Abbott (1989) in his well known *Compendium of Landshells*.

Both species are easily distinguished by the following features: *O. lactea* has a dark brown to black aperture and lip, with usually a well-developed dent-like ridge on the latter. *O. punctata* has also a dark brown aperture but the lip is always whitish while the dentlike ridge is usually lacking.

So far only *Otala lactea*: the Milk snail (Turgeon et al., 1988), has been reported from the U.S.A. However, there are strong indications that *Otala punctata* also has managed to get a foothold in North America. Stange (1979) mentioned, for example, that the color of the lip and the aperture in the Milk snail (= *Otala lactea*) is of a liver-

brown to almost black, sometimes white. There is no indication that he described individual snails or populations. In case he described a population of *Otala* with white lips, then he was almost certainly dealing with *O. punctata*. As a matter of fact, I was recently able to study specimens collected by Dr. Harry G. Lee in Fernandina Beach, Nassau County, Florida, which belong without doubt to *O. punctata*.

In order to verify the status of the introduced populations of *Otala* in North America, I would be very pleased to receive any information concerning material in local collections. Besides exact locality data, it is important to note the color of the lip. Even better: I would appreciate receiving any samples of *Otala* from the U.S.A. for personal study, either on loan or for permanent storage in the National Mollusc Collection of the Hebrew University of Jerusalem. In the latter case the donor may expect some samples of landsnails from the Middle East in return.

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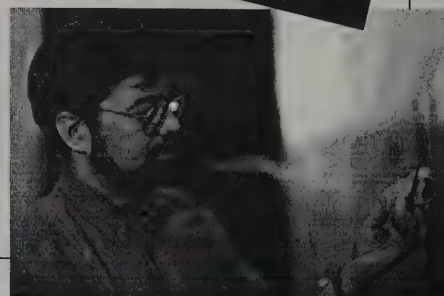
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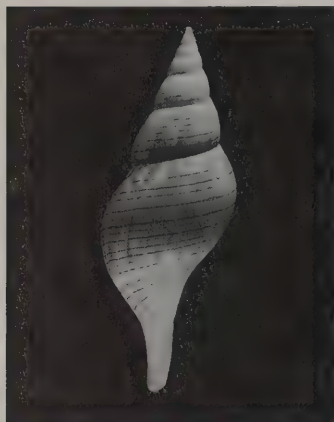


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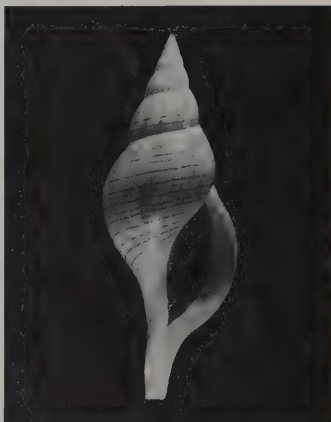
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WESTERN ATLANTIC FASCIOLARIA

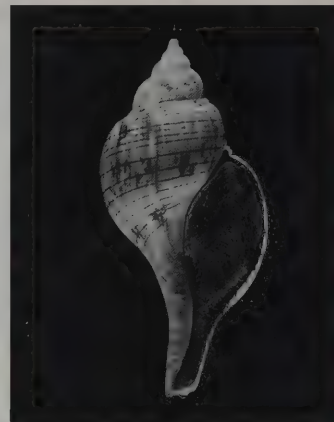
by Kevan and Linda Sunderland



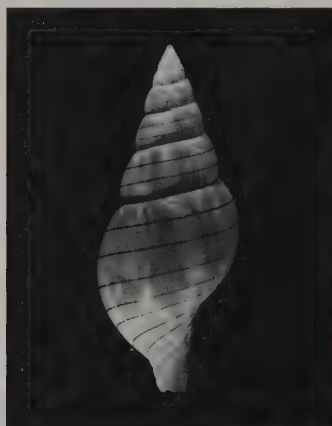
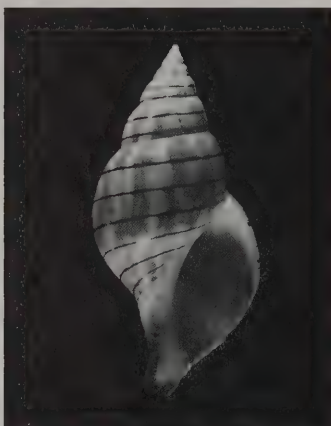
Fasciolaria bullisi Lyons, 1992. 163 mm. 140 meters in lobster traps off Ft. Myers, FL.



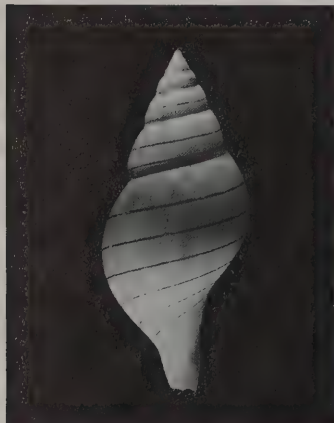
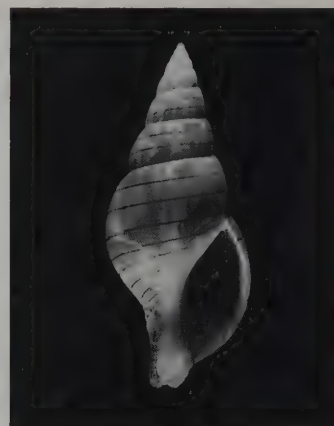
Fasciolaria hollisteri Weisbord, 1962. 120 mm. 3' off Amuay Bay, Venezuela.



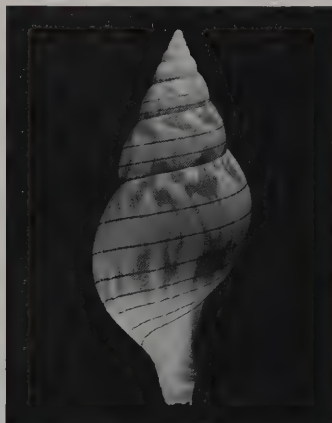
Fasciolaria lilium hunteria (G. Perry, 1811). 115 mm. 30' in stone crab trap off Everglades City.



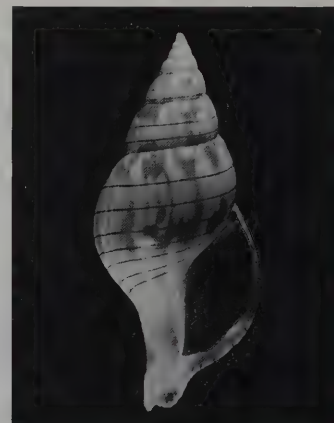
Fasciolaria lilium tortugana Hollister, 1957. 112 mm. 250' by shrimp off Contoy Light, Yucatan, Mexico .



Fasciolaria lilium tortugana Hollister, 1957. 102 mm. 220' by shrimp off South Side of Key West, FL.



Fasciolaria lilium tortugana Hollister, 1957. 108 mm. 160' by calico scalloper, off Cape Lookout, NC.

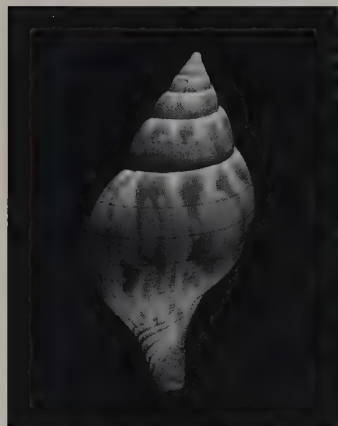


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 URL gopher://erato.acnatsci.org:70/11/wasp.

The intent of this feature is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



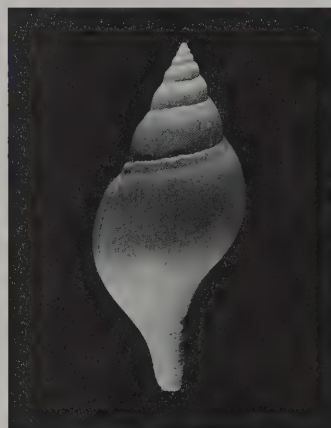
Fasciolaria lilium hunteria (G. Perry, 1811). 65 mm. Intertidal off Matanzas Inlet, FL.



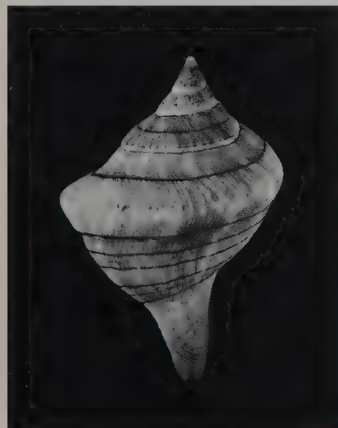
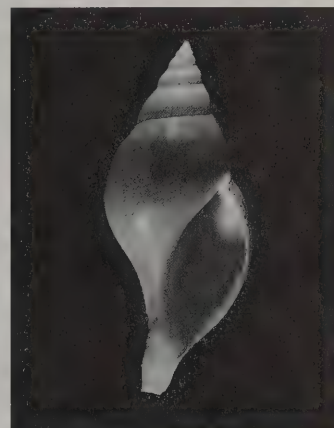
Fasciolaria lilium branhamae Rehder & Abbott, 1951. 134 mm. 120' by shrimp, off Yucatan, Mexico.



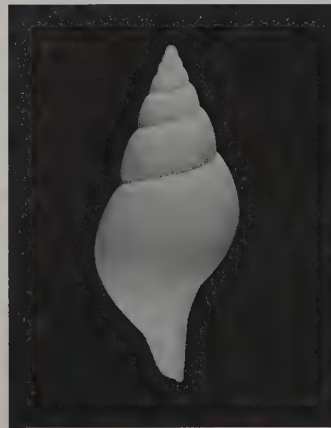
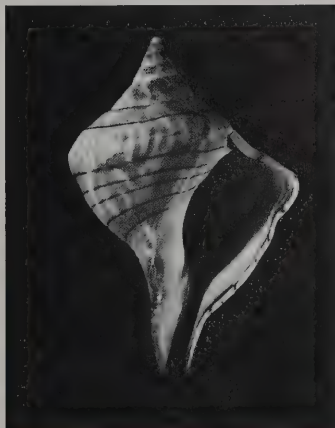
Fasciolaria lilium lilium G. Fischer, 1807. 125 mm. 40' by shrimp, off Brownsville, TX.



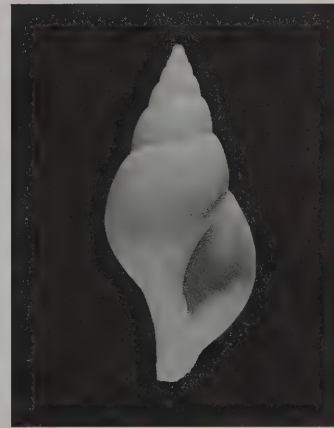
Fasciolaria tulipa (Linné, 1758). 135 mm. 200' in lobster traps, from off Key West, FL.



Fasciolaria lilium hunteria (G. Perry, 1811). 58 mm. On Bogue Banks, NC, after storm. Freak.



Fasciolaria lilium tortugana (Hollister, 1957). 75 mm. 200' by scalloper, off Cape Canaveral, FL. Albino.



CONCHATENATIONS

Species Concepts for Mollusks

by Gary Rosenberg

Sooner or later everyone with enough interest in mollusks to learn their scientific names confronts the species question. They ask, why are these two shells that look so different the same species? Why are these shells that seem almost identical called by different names? Soon they learn the most widespread definition of a species, the so-called biological species concept: *a set of organisms able to breed among themselves, but unable to produce fertile offspring with members of other species.* (For example, horses and donkeys are different species and their offspring, the mule, is sterile.) This leads them to assume that those differing shells are the same species because they interbreed, and those similar shells are different species because they cannot interbreed.

A good example of the application of the biological species concept to mollusks is the case of *Conus pennaceus* Born, 1778 and *Conus elisae* Kiener, 1845 in Hawaii. Frank Perron (*Hawaiian Shell News*, April 1979) proved that individuals with the normal tented pattern of *C. pennaceus* and the axially compressed pattern of *C. elisae* can hatch from the same egg capsules and thus are different forms of the same species, rather than two different species. For more than 99% of mollusk species, however, there is no direct evidence whether they can interbreed with other closely related species. They are defined as species not because they are reproductively isolated from other species, but because they supposedly do not intergrade in morphology with other species. What are the consequences of this disconnect between theory and practice?

Consider the case of hybrids. Under the biological species concept, if the hybrids are fertile, the parent species are actually a single species. If the hybrids are infertile, then the parent species are distinct. Under a morphological species concept, hybrids would not be recognized as such unless they represented a morphology intermediate between, but distinct from, the parent species. Otherwise the parent species would appear to intergrade and would be synonymized.

With mollusks we rarely have direct evidence that animals are hybrids. Take the case of *Lambis arachnoides* Shikama, 1971 and *Lambis wheelwrighti* Greene, 1978, which were named as new species and then identified as hybrids of *Lambis truncata* (Lightfoot, 1786) and *Lambis millepeda* (Linnaeus, 1758). As yet, breeding experiments have not been done to prove their status as hybrids, although Gijs Kronenberg (1993, *Vita Marina* 42:41), made a good case based on their morphology. Also, at least in plants, it is possible for species to have hybrid origin. This can happen in rare cases when incompatibility between the chromosomes of the parent species is resolved by doubling of the chromosomes in the offspring species. This leaves the offspring species unable to interbreed with the parent species, because it has twice the number of chromosomes, a condition known as polyploidy. Thus proof that an individual is a hybrid is not necessarily proof that it is not a different species.

There are further complications with hybrids. Suppose that we have a case with three distinct morphologies, suggesting a rare hybrid and its parent species. Breeding experiments in the laboratory show that hybrids of known parentage are interfertile with both parent species and that second and third generation hybrids have a range of intermediate morphologies. Should the laboratory evidence override the knowledge that these species remain morphologically distinct in nature? For botanists it would not! It is not unusual among plants to have fertile hybrids between species, even of different genera. Also, successful interbreeding in the laboratory doesn't imply successful

interbreeding in nature. Perhaps the species are for the most part reproductively isolated from each other. Maybe the interspecific matings only rarely result in fertile offspring.

The evolution of reproductive isolation is best understood in the context of speciation resulting from geographical isolation. Suppose that unusual currents allowed a group of veligers to reach an island where their species had not previously been represented, and the population evolved in isolation until it possessed characteristics different from its parent population on the mainland. Eventually the offspring species might recolonize the mainland. Interbreeding with the parent species becomes possible, but the hybrid offspring are not as fit as the purebred offspring. For example, the offspring species might have evolved to use a different food source than the parent species and the intermediate hybrids might not be well adapted to use either food source. In such cases, we would expect the species to evolve "isolating mechanisms" that let them avoid mating with each other, because they will produce more offspring by mating with their own species than by mating with the other. These isolating mechanisms might be breeding at different seasons, incompatibility of egg and sperm, or pheromonal recognition of potential mates.

The biological species concept recognizes species when they have diverged to the degree that reproductive isolation is complete. "Phylogenetic species concepts" might recognize species long before they have evolved complete reproductive isolation. One flavor of phylogenetic species concept defines a species as "the smallest aggregate of populations (sexual) or lineages (asexual) diagnosable by a unique combination of character states in comparable individuals." This means, in the example above, that if all individuals in the offspring population can be positively distinguished from individuals in the parent population on the basis of morphological characteristics, then they constitute a different species, regardless of degree of reproductive isolation. This species concept is not without its peculiarities however. Taken to its limit, it implies that there is a point in time when the death of the only remaining individual with a particular characteristic creates the condition of uniqueness that diagnoses the species.

Another disadvantage of the biological species concept is that not all mollusks reproduce sexually. The freshwater snails *Potamopyrgus antipodarum* (Gray, 1853) and *Melanoides tuberculatus* (Müller, 1774) can reproduce parthenogenetically, meaning that the eggs develop without being fertilized. In *P. antipodarum* only one in ten thousand individuals is male. In addition to not being applicable to asexual species, the biological species concept cannot be applied to organisms known only as fossils. Note also that all living organisms have an element of reproductive continuity between them; there must be a continuous chain of reproduction from the present back to the primordial soup. This continuity of populations in time is a problem, not just for the biological species concept, but for any species concepts. One attempt to resolve it is the theory of punctuated equilibrium, which claims that speciation usually occurs through short bursts of rapid change, with long periods of morphological stability between.

Suppose we knew the true pattern of evolution among a group of species, as represented in a tree of relationships. A fork at the tip of a branch on this tree represents the divergence of two species at some point in the past. Take again the example of the island and mainland populations. At what point did they become different species? At the moment one population reached the island? At the moment that all individuals on the island had a unique characteristic or combination of characteristics possessed by none of the individuals on the mainland? At the point when they started evolving reproductive isolation? At the point when they finished evolving reproductive isolation?

In the end, there is no such thing as a universally applicable species concept. Nature is simply too complex and too continuous. There are too many kinds of reproductive systems, and too many modes of spe-

(Continued on bottom of next page.)

1999 SUMMER & FALL SHELL SHOWS AND MEETINGS

by Donald Dan, COA Trophy Chairman

- Jun. 13-17 **Western Society of Malacology Annual Meeting**,
Cal State University Fullerton
Fullerton Marriott Hotel, Fullerton, CA.
Dr. Roger R. Seapy, Dept. of Biological Science
California State University, Fullerton, CA 92834-6850
(714) 278-2265 Fax 278-3426
E-mail: rseapy@fullerton.edu
- Jul. 4-9 **65th American Malacological Society Meeting**
Sheraton Hotel, Station Square, Pittsburgh, PA
Robert S. Prezant, Dean,
Div. of Mathematics & Natural Sciences
Queens College, City University of New York
Flushing, NY 11367-1597
email: rprezant@qc.edu (718) 997-4105
- Jul. 10-11 **Keppel Bay Shell Show**, Yeppoon, Queensland, Aust.
Jean M. Offord, 277 McDougall St., N. Rockhampton
Qld. 4701, Australia 61 (749) 283-509
- Jul. 17-18 **Townsville Shell Show**, Townsville, Qld., Australia
Cutharinga Bowls Club on Harold Street, West End
Glenda Rowse, 19 Farrell Street Kirwan 4814
Queensland, Australia 61 (747) 732-817
- July 31-
Aug. 1 **Jacksonville Shell Show**, Jacksonville Beach, FL
Ramada Inn Resort, 1201 North 1st Street
John Fatu, 14148 Tomas Point Lane
Jacksonville, FL 32225 (904) 221-4230
email: tongajohn@aol.com
- Aug. 20-22 **Jersey Cape Shell Show**,
Wetlands Institute, Stone Harbor, NJ
Jersey Cape Shell Club, P.O. Box 124
Stone Harbor, NJ 08247 (609) 653-8017
- Sept. 10-12 **North Carolina Shell Show**,
North Carolina Aquarium at Ft. Fisher, NC
Ann Buddenhagen, 804 Westwood Drive
Raleigh, NC 27607 (919) 782-8903
email: pabjetster@aol.com
- Sept. 18-19 **Central Florida Shell Show**,
Central Florida Fairground, Orlando, Florida
Jake Dominey, 700 Tam O'Shanter Drive
Orlando, FL 32803 (407) 894-3033
- Sept. 18-19 **International Shells & Fossils Bourse**,
Ottmarsheim, France
Salle Polyvalente, Rue de la Priscine
Michel Rionat, 2 Rue des Vergers
68490 Ottmarsheim, France (3) 89-26-16-43
- Oct. 1-3 **Annual German Shell Fair**, Vienna, Austria
Wolfgang Fischer, Matiniggasse 26
A-1220 Vienna, Austria
43 (1) 47654-3302 FAX-3342
email: h330p6@edv1.boku.ac.at
- Oct. 30 **British Shell Collectors' Club Shell Show**,
Napier Hall, Hyde Place & Vincent St., London
Kevin Brown, 12 Grainger Road, Isleworth, Middlesex
TW7 6PQ, England 44 (181) 568-8333
- Nov. 7-8 **Philadelphia Shell Show**,
Philadelphia Academy of Nat. Sciences
Franklin Parkway & 19th Street, Philadelphia, PA
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Sahara Dust Killing Coral?

Up to a billion tons of dust is blown across the Atlantic from the Sahara Desert in Africa yearly as North Africa becomes increasingly arid. This phenomenon, most common in summer months, may be a major culprit in the dying of the coral reefs of the Caribbean as it settles out of the atmosphere and blankets the reefs. The same dust may carry pesticides that are banned in the U.S. and that are capable of much more extensive damage.

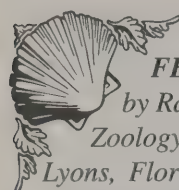
ciation. How do we deal with animals like the Jamaican landsnails *Pleurodonte lucerna* (Müller, 1774) and *P. sublucerna* (Pilsbry, 1889) studied by Glenn Goodfriend, (1983, dissertation, University of Florida) which have nicely distinct shell morphology and genital anatomy at most places where they co-occur, but in one area form a hybrid zone with intergrades. Perhaps, as Goodfriend suggested, they are "semispecies" in the process of evolving reproductive isolation. What do we make of ring species, where population A interbreeds with B, B with C, and C with D, but A cannot interbreed with D?

Arthur Cain said in 1944, "A species is what a competent taxonomist thinks it is." He also said, "A species is a group of individuals which, in the sum total of their attributes, resemble each other to a degree usually accepted as specific, the exact degree being ultimately determined by the more or less arbitrary judgement of taxonomists."

Barnacles produce a glue that is twice as strong as epoxies used in space craft and thinner than a coat of lacquer, scarcely affected by temperature highs or lows. Such a glue would be of great use in orthodontics and orthopedics, not to mention other technological uses!

— The Pelican Post, Fall 1998

Do species really exist in nature, or are they constructs of the human mind? Clearly there are different lineages in nature. Problems arise in deciding how tiny a twig on the tree of life deserves to be called a species, and in not confusing twigs with leaves (seeing gaps where there are none and vice versa). Each species must be treated on its own merits, and the competent taxonomist must seek out the evidence that establishes its status. Some types of evidence are sufficient to prove that two kinds are different species, other types are sufficient to prove that two kinds are the same species, but there is no class of necessary evidence, that is, there are no definitive tests, that will apply in all cases. In practice much of the evidence is merely suggestive, and most of it is based on morphology. My next column will therefore focus on practical rather than theoretical aspects of identifying molluscan species.



SALLY DIANA KAICHER

FEBRUARY 19, 1922 – MARCH 29, 1999

by Raye N. Germon, Department of Invertebrate Zoology, Smithsonian Institution, and William G. Lyons, Florida Department of Environmental Protection, Florida Marine Research Institute



Sally in the early 1950's with three of her four greatest loves: son Tim Lee on the left, a tray of shells, center, and Jim Kaicher on the right. (Sally's son John Kaicher, not pictured, makes the fourth.)

Sally Diana Kaicher was born February 19, 1922, in Berlin, New Hampshire. Her father was a plant manager for paper mills and the family was transferred from New Hampshire to Canada and eventually to Philadelphia where Sally attended Mt. Holyoke College and the Philadelphia Museum School for Industrial Arts. She had enjoyed a privileged upbringing as an only child, even sailing to England with her mother on the *Queen Elizabeth* during the depression in 1934. But virtually all support from her family stopped when she finished her education, and she spent much of the rest of her life, as most of us do, trying to make a living.

Sally worked as a scientific illustrator at the American Museum of Natural History in 1949 and at the Academy of Natural Sciences of Philadelphia in 1950, where she produced the technical drawings for Volume II of Rehn's (1953) *The Grasshoppers and Locusts (Acridoidea) of Australia*. She spent 1951 and 1952 at the Smithsonian Institution, Washington, D.C., where she illustrated early drawings for *The Treatise on Invertebrate Paleontology* (Knight et al., 1960. Dr. J. Brooks Knight was a pioneer in the modern studies of Paleozoic gastropods.) At the Smithsonian, Sally also met Dr. R. Tucker Abbott, beginning a friendship that would last until his death in 1995. Sally went to the U.S. Department of Agriculture in Washington, D.C., from 1952 to 1954, where she illustrated systematic works on foraminiferans, mosquitoes, and other complex groups. As an independent artist,

she wrote, illustrated, and produced *Indo-Pacific Sea Shells* (Kaicher, 1956-57), a "popular" work in seven parts, which was cited as a valuable contribution for its time (Spry, 1961). In the latter 1950's Sally left scientific illustration and worked in advertising, producing commercial art and writing copy, but she left that field in the 1960's, supporting herself thereafter as a free-lance artist and writer. She wrote and illustrated several film strips for science education in the 1960's, and their popularity provided royalties that helped to sustain her until the advent of video films in classrooms. Sally provided the habitat illustrations for *Caribbean Seashells* (Warmke and Abbott, 1961), and she illustrated *Pond Life* (Reid, 1967) and several other popular natural history guides. She wrote some of the molluscan descriptions and other text for *Seashells of North America* (Abbott, 1968); she wrote the section on mollusks for the *Readers Digest* guide to North American wildlife (Kaicher, 1982); and she published two scientific papers on mollusks (Kaicher, 1972; Lyons & Kaicher, 1978).

Sally was justifiably proud of the *Card Catalogue of World-Wide Shells*, a series of 3" x 5" index cards that she issued in 60 "card packs" between 1973 and 1992. Each card provided illustrations and diagnostic comments for a single species, and more than 6,000 species were treated on the approximately 6,300 cards released (replacement cards were issued for some species as better information became available). Sally did the research, took the pictures, wrote the text, pasted up the cards, and, to reduce costs of the card packs, she even stripped the negatives for the printer. To enhance the usefulness and accuracy of the card packs, Sally illustrated type specimens for many of the species, visiting most of the major museums in this country and traveling as far as London and Sydney to photograph types in those museums. She was assisted in this effort by museum curators throughout the world, who loaned material for her to photograph or sent photographs for her to use. The resultant work constitutes an important resource for the identification of marine gastropods for both shell collectors and professional malacologists; the cards have been cited in many studies of molluscan classification. The series has been placed on the Official List of Works Approved as Available for Zoological Nomenclature (ICZN, 1998). A collation of the card packs has been prepared by Richard E. Petit and Gary Rosenberg and will be published soon.

Sally had a deep love of shells and collected for many years, travelling to Panama, the Bahamas and Cayman Islands to enhance her collection of Nassariidae, Olividae and Marginellidae. However, when she became involved in the card packs she mostly quit collecting for herself even though people throughout the world continued to send specimens to her. Sally also delighted in photographing small mollusks, especially living specimens. She was an early advocate of the idea that color patterns and morphological features of the soft parts of living animals could be important clues to their classification, and she freely shared her pictures and observations with professionals engaged in studies of various groups. Sally's generosity was well known to many, including some now-professional malacologists who, when lacking the funds for "professional" photography for a student paper, found that they could count on Sally to provide the photographs at no cost.

(Continued on next page)



A much more recent photo of Sally Kaicher with Florida shell dealer Bob Lipe.

SPENCER WILKIE TINKER 1909-1999

It is with considerable sadness that we announce the death of Spenser Wilkie Tinker on April 9, 1999 at the age of 90. He died in the Maunalani Nursing Center in Honolulu and is survived by his wife, Gwen, son, George and two grandchildren.

While Spenser, usually called Spense, was known primarily as the former director of the Honolulu Aquarium, to the shellers of Hawaii he was best known for his book *Pacific Sea Shells*, published in 1952 in soft cover. The book was revised with a fourth printing in 1962. For many years, it was the primary reference for most shell collectors in Hawaii, and was equally useful in other Pacific areas, even though it primarily dealt with Hawaiian shells. Larger books with color illustrations such as R. Tucker Abbott's and S. Peter Dance's *Compendium of Seashells* were not available until 1982, a fact which made this a very important book from 1952 until 1979 when E. Alison Kay published the massive *Hawaiian Marine Shells*.

After I was transferred to the arctic shores of Boston in 1957, I did not have a copy of *Pacific Sea Shells* and had to make a trip to the local library in Waltham, MA every three weeks to renew my loan of that book while identifying the shells I had collected in Hawaii. Later, I was able to find a hard cover copy in a swap meet sale in Los Angeles. The book was remarkably accurate, with most mollusc names still valid today.

Spenser was important to the Hawaiian Malacological Society, particularly during its early days in the 1940's. For many years the society met at "his" aquarium, and for quite a period he had on exhibit at the aquarium the best collection of shells available to the public. Today, this is not a popular type of display at museums to the dismay of shell enthusiasts.

Spenser was born in Anamoose, North Dakota and graduated from the University of Washington in 1931. His lengthy stay in Honolulu started in 1932 when he became a teaching fellow in the zoology department of the University of Hawaii. In 1934 he received his master's degree in zoology and subsequently served as an instructor in zoology at U.H. for a year, followed by five years in education. In 1940, Spenser became the director of the Waikiki Aquarium. His service at that institution was interrupted in 1941 by WW2 when he began service in the Army Quartermaster Corps; he left that service in 1946 with the rank of army captain. After leaving the army, he was director of the Honolulu Aquarium until 1972 when he retired. His work in many fields, however, continued.

Spenser's writings included *Animals of Hawaii* in 1938; *Stories of Hawaiian Animals for Boys and Girls* in 1940; *Hawaiian Fishes* in 1944; *Pacific Sea Shells* in 1952; *Pacific Crustacea* in 1965; *Sharks and Rays of Hawaii* in 1972; and *Fishes of Hawaii* in 1978 which was the definitive work on Hawaii Fish Species (I obtained my autographed copy at an HMS meeting then) and *Whales of the World* in 1988.

The butterfly fish *Chaetodon tinker* Schultz, 1951 was named for Tinker. Originally, it was thought to be restricted to Hawaii, but has been found in deep water in other Pacific areas.

We shall all miss him. It seems that many of our shelling friends are leaving of late: Burgess, Kaicher, and now Tinker in such a short period.

—Wesley M. Thorsson

In Memoriam

FLORENCE KUCZYNSKI

NORRIS MCELYA

FLORENCE KUCZYNSKI 1924-1999

Florence Kuczynski passed away Sunday April 4th in her sleep at the age of 75. She was a member of the St. Petersburg Shell Club for over 40 years and the club treasurer for over 20 years. She provided invaluable help as treasurer for the 1996 COA Convention in St. Petersburg. She was also a COA member.



Florence travelled to many places around the world, most recently to China. While her last talk to our club in January on this fascinating country didn't discuss shells, we enjoyed it very much.

She was a volunteer at the St. Petersburg International Museum and at the library.

Florence was laid to rest Thursday April 8th. Her passing left a large void in our club and our hearts.

— John L. Jacobs, St. Petersburg Shell Club

(Kaicher continued from previous page)

Sally's health had been in decline for several years, and she died on 29 March, 1999, in Tampa, Florida. She leaves three sons, Mr. Timothy F.M. Lee, Irmo, South Carolina; Dr. John H. Kaicher, Aurora, Colorado; and Mr. James B. Kaicher, Tampa, Florida; and several grandchildren. A memorial service for Sally will be held in Tampa, Florida on June 17th. Her ashes will be scattered at sea.

Sally Kaicher was a genuine original in every way. Her personality was generally cheerful, often gleeful, and her presence in a room was seldom overlooked. She was a creative artist, writer, and photographer. Her character was the kind that embraces fundamental values but questions authority. She was fiercely independent and could not stand to work for anyone, yet she was extremely loyal to her friends and to the institutions and their curators who shared her love of malacology. She was respected and highly regarded by all of us who had the pleasure to know her. She will be missed.

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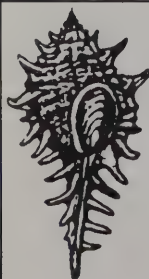
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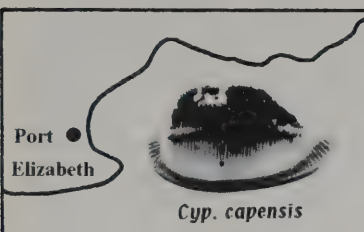
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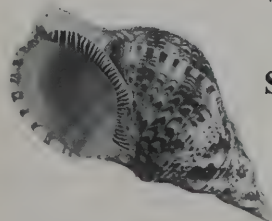
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Shells on the Internet

by Tom Eichhorst

Don't skip this article because you don't have a computer or you've never been interested in the Internet. A marvelous world is only now becoming available because of computers and the Internet. Collecting seashells can often be an isolated hobby, just you, the shells, and some books. Okay, I'll admit, sometimes I like isolation, but I enjoy my shells much more when I can share my interest with others. This is why we form shell clubs. Well, the Internet can do all of that and much more. So if you have considered buying a computer or if you have a computer but haven't really investigated all that is available on the Internet, read on. If you are an Internet pro maybe you can let me know if you agree with my reviews or if I have missed the boat somewhere.

This is intended as a review of a few shell related web sites that can open up an entire new aspect of the hobby. Ever wonder what a *Pleurotomaria gotoi* looks like? Can't find a certain shell book? It is all on the Internet. There are literally hundreds of great shell related sites there. I will review three of these in this issue, three of the best. Remember, these are my selections and are only three of hundreds, many equally as good. The first is the COA web page, The Conch-Net. I selected it because it is an excellent example of an institutional web page and offers items of interest for the casual web surfer as well as the professional conchologist. The second web site I will talk about is Guido Poppe's web page, an excellent dealer web site offering much more than a price list. Finally I will introduce you to the Jacksonville Shell Club page, a site I believe sets the high water mark for shell club web pages. So let's get going and see if I can spark an interest.

Conchologists of America (The Conch-Net)

<<http://coa.acnatsci.org/conchnet/>>

The Conchologists of America web page was created by the Lambis Group of COA under the guidance of Webmaster Deborah Wills. They have done a masterful job in designing a web page to educate the novice and still provide something of interest to the professional. The main page provides links to such areas as: Conch-L, What's New, the Shells, FAQs (frequently asked questions), Conventions, Publications, Conchology, Grants, Collecting, Clubs, Conservation, Events, Kids' Section, COA Organization, *American Conchologist* Library, Join COA, and Information. A click on any one of these will take you to that area. Let's sample a few:

First is "Conch-L," a list server. Once you register (or "subscribe") you will join some 300 other folks also interested in shells. Each person on the list gets every message sent to the list in general. Think of it as being in the lobby at a COA convention with a myriad of conversations going on all around you, all having to do with shells. It sounds chaotic but it is actually very simple, with an average of 10 (mostly shell related) messages daily. This is the perfect place to ask a question or share your expertise. A recent example: "How many species are there of *Janthina*?" Don't know? Join Conch-L and find out. There is also an archive section so you can search for items of interest. I guarantee you will meet and form friendships with some wonderful people.

My next favorite section is the link "Conchology." Here you will find "Conchology 101" by Dr. Gary Rosenberg. In straightforward, concise, and easy-to-read prose, Dr. Rosenberg explains what a mollusk is, classes and classification of mollusks, taxonomy, species, etc. Adapted from his book, *The Encyclopedia of Seashells*, (1992), this is one of the best introductions to mollusks you will find. Once you have the basics down, try the link, "The Shells." Here you get specific information on families of shells, definitions of species, subspecies, etc. and lots of information on seashells, land shells, and fresh water shells. There are articles here you will not want to miss, including informa-

tion on deep-sea mollusks and micromollusks. Ever hear the term "lumper" or "splitter" and wondered what it meant? It is here.

The other links are pretty much self-explanatory. One remaining link of note is "Information." Here you will find links to other shell web pages. There are only a few links listed on this page which is too bad as there could be hundreds of links. However, many of the links listed here contain further links to other shell related web pages. So this serves as a doorway into many, many web sites. If you know someone interested in shells who has a computer, give them the COA web page as the best place to start investigating shells on the Internet.

Conchology - Guido T. Poppe

<<http://www.conchology.uunethost.be/>>

The next site is Guido T. Poppe's web page, "Conchology." Guido Poppe is a well-known shell dealer and author from Belgium and his site reflects his expertise. The site has a list of shells for sale (he is a shell dealer, after all), but it contains much, much more. There is a bit on Poppe and his shell collecting, a list of links to other pages related to shells (clubs, dealers, sites on special interests, etc.), some acknowledgments, and two additional areas unique to this site and of great value to any shell collector or anyone interested in shells.

The first section is entitled "collecting." Here you will find a list of shell clubs and international organizations, Internet sites about shells, and a list of books recommended for the person interested in shells and shell collecting. Mr. Poppe has broken this last area into a recommended "starter" list of books for beginning collectors, a list for advanced collectors, a list for specialists, and some examples of very old manuscripts on shells. These come complete with illustrations. At the click of the mouse you can see an illustration of *Conus geographus* from *Les delices des yeux et de l'esprit*, a book published in 1768, or *Nautilus pompilius* from Kai Chigusa, an ancient book on shells from China. This section also describes how to collect (self collecting, trading, and buying), how to store and care for shells, shell grading criteria, and some ecological concerns and shell conservation. This is an excellent treatise on the basics of collecting seashells.

The last section I will discuss is my personal favorite, "Cyberconchology." This unbelievable section begins with a list of the seven classes of mollusks. A mouse click on any class will bring up a menu of the families in that class. Clicking on a family brings up a list of the species in the family, alphabetically listed by genera with author, year, and the type species indicated. Many species also have an accompanying image. This section contains the scientific names of more than 50,000 species with over 5,000 images. The images are excellent and you will find pictures of shells here found nowhere else. This is a quality site that offers a tremendous amount of information for shell collectors.

Jacksonville Shell Club Home Page

<<http://home.sprynet.com/~wfrank/jacksonv.htm>>

The last site is the Jacksonville Shell Club, Inc. web page, created and run by a friend of mine named Bill Frank. This is a web page with a lot to offer and it continues to evolve and get better.

When you first open the site you will find the standard description of the club, some club history, meeting details, a bit on the club newsletter, the *Shell-O-Gram*, a list of club officers, and the e-mail address of the club president. Next are several areas of interest. If you click on "Selected Past Articles," you will find an index of over 40 articles that have appeared in the *Shell-O-Gram*. Here you can read about scallop fisheries, collecting trips, species- and family-specific articles and more. Two of my favorite articles (one is actually a three-part series) were written by club member Dr. Harry G. Lee. In the three-part article "Mollusks and Man—A Medical Perspective," Dr. Lee discusses man's history of mollusk-related infection, poisoning,

Living At the Edge

by Ross Gundersen

When I was growing up, seems like yesterday, scientists were thinking about life on Mars. They thought the environment would be very harsh with wide temperature fluctuations, very little water, and a rocky, treacherous terrain. Organisms living in this environment would be unlike those found on earth and obviously adapted to living in an extreme environment. Needless to say, we are still trying to find life on Mars. However, these early investigations into life on other planets spurred work on organisms living in extreme environments on our own planet. We now have found organisms living in ice in Antarctica, hot arid extreme deserts and the cold depths of the oceans. These organisms are adapted to living in extreme environments.



A view of the rocky Jamaican shoreline which is home to several supralittoral mollusks. While this shoreline is picturesque by our standards, it is a formidable environment for mollusks.

Conjure up in your imagination a rough, rocky terrain dominated by sharp crags and shards of rock. On top of this, imagine yourself being exposed to temperatures ranging from 45 to 140 degrees with no water. How about being encased in salt during these same extremes? In addition, there are times you will be alternately inundated by salt water and fresh water. Needless to say, humans would not prosper under these conditions. But mollusks are living in SUCH extreme environments, indeed harsh and formidable by our standards. These mollusks, the supralittoral tropical mollusks, are literally and figuratively "Living At the Edge." They live above the high tide line in exposed conditions on a rugged rocky terrain composed of eroded limestone called karst. Examples of these mollusks are the familiar *Cenchritis muricata* (Linné, 1758), *Tectarius antonii* (Philippi, 1846), *Nodilittorina tuberculata* (Menke, 1828), *Puperita pupa* (Linné, 1767) and *Batillaria minima* (Gmelin, 1791). I have encountered these prolific and common mollusks all along the rocky shores of Jamaica.

How do these mollusks prosper, even live, in these extreme environments? Surprisingly enough, food is not an issue. There is plenty of heat- and salt-loving algae growing on the rocks, even if it is not apparent to us. The real difficulties are water and heat. Let us take these in order. Those of us who are gardeners have occasional encounters with slugs. One way of killing them is sprinkling them with salt. The salt draws water from the slug, dehydrating it and killing it. Dehydrating one with a hair dryer would be equally effective, but less cost effective. So heat and high salt levels kill by dehydration. How do our supralittoral mollusks deal with these? Of course they have shells as direct barriers for water loss due both to heat and salt. However, these shell barriers aren't that effective, and water can leave relatively freely through the operculum.

The answer to their problem is deceptively simple: mollusk

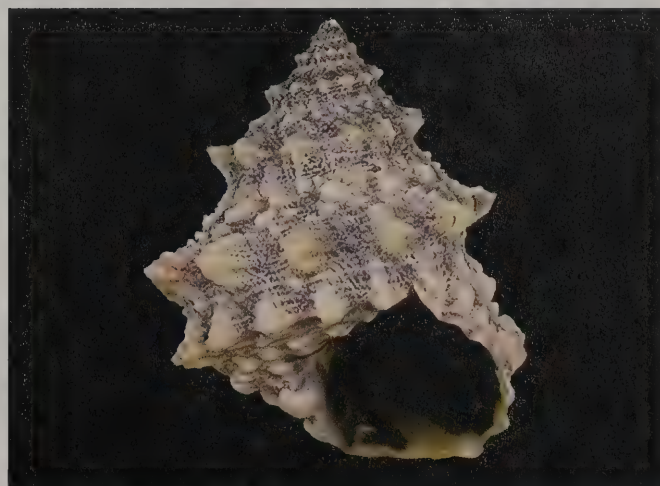


Cenchritis muricata (Linnaeus, 1758) is abundant on Jamaica's rock shores. It lives a considerable distance from the water's edge.

snot/slime/mucous technically known as mucopolysaccharides. Mucopolysaccharides are long chains of proteins with attached sugar molecules. One of their amazing properties is to tenaciously hang onto water. When the going gets rough the mollusk withdraws into its shell and secretes a thin mucous window to cover the aperture. This effectively prevents water loss. I have taken some *Cenchritis muricata* and placed them in a dry dish covered with salt for a month. Just add water, and voila, they emerge, voraciously hungry.

Heat can cause problems other than water loss, namely death by cooking. Most of the chemical reactions associated with life in mollusks, and life in us, occur due to the presence of special proteins called enzymes. These enzymes have specific shapes which give them some of their properties. If you apply enough heat TO a protein (enzyme,) it changes its shapes and loses its unique properties: it no longer can carry out its specific function and support life. You all have seen the change in shape of a protein, but may have not realized it. When an egg hits the frying pan the white goes from colorless to white as well as from liquid to solid. This problem cannot be solved by slime. We can extract the enzymes in mollusks and measure their properties. As it turns out, these mollusks have different forms of the same enzymes which function at higher temperatures and can support life at

(Continued on page 31)



Tectarius antonii (Philippi, 1846) is also an abundant supralittoral mollusk which lives closer to the water's edge than *Cenchritis muricata*.

Wild Adventure: Try to Collect Brazilian Land Shells With Me...

by José Coltro

I am deeply interested in land shells. I really like them. This interest started about 10 years ago with my friend Ricardo Guerrini, a land shell lover. Ricardo always wanted to travel and look for species in the forest, the fields and other wild places. He is a very enthusiastic and detail-oriented collector. He always tries to push me to inside the jungle....I, who am a really urban person! I live in the middle of a city of twenty million people!. My contact with nature is limited to my small backyard and the park near my house. Most of my family is the same. My sister never saw a real pig or lamb—only on TV.

I am also a little bit big. OK, I am fat, too! Besides that I have a very good disposition. I love to collect shells and when I am shelling I am the first one to wake up, prepare the equipment to dive, etc. You always can count on me to dive, snorkel or even beach collect. I could spend hours looking for shells! Marine shells, that is.

As an urban person, I am not used to forests and fields. And I worry a lot while walking in a wild place. I am terrified of ... spiders! I really don't like them, any size, any color or shape. I don't like even the most common ones that you may find at home. I don't care about scorpions, snakes or another wild animals, but no spiders! I confess I am chicken! Well, after everything that you already know about me, I will tell my stories:



One of the beauties I miss because of spiders!

As I told you, Ricardo always tries to push me into the jungle to look for land shells. I have always had some really good excuses, like "I am not feeling well" or "I am too busy reading the telephone directory." Once he trapped me and I couldn't escape. I had to go land shelling! We were at Ilhabela, a great place for marine shells... We were in a friend's house far from the beach and on the slope of a gorgeous mountain, covered by a wonderful tropical rain forest. Ricardo, his wife Gracy, my brother Marcus and I started to walk inside the for-



One of our beautiful...and spiderful...Brazilian forests!

est. It was really beautiful. This forest has high trees, orchids, wild flowers, and small rivers with lots of waterfalls. Gracy is of Japanese descent, a very small and delicate person. We were walking and Gracy was behind me. Suddenly I touched a spider web—with a spider! I jumped back and I almost smashed Gracy!

Some time ago I went to Trindade Island, in the middle of the South Atlantic. It is an isolated island with little vegetation. There is a Navy base and Marcus and I stayed there for a short time. We had to sleep in the infirmary and the bathroom was full of some kind of huge spiders. I had set out to kill them with an insecticide spray when a monster dropped from the ceiling just a few centimeters from my face. I jumped again and this time I really smashed someone, a biologist who was watching me in action.

After cleaning the bathroom we started our shelling trip. The island is full of small mountains, most covered by a kind of large, wild grass. During our journey we found some really dead *Bulimulus lopesi*—an

(Continued on page 31)



A SPIDER!!!

New Molluscan Records for the Northwestern Gulf of Mexico

by Emilio García



Daphnella reticulosa Dall, 1889



Epitonium polacium Dall, 1889

The northwest Gulf of Mexico is characterized by a series of pinnacles that rise abruptly from the smooth sediment of the bottom. Interestingly, the molluscan fauna of these pinnacles has many species that are found in the shallow waters of the Caribbean, species such as *Charonia variegata* (Lamarck, 1816), *Cypraea acicularis* Gmelin, 1791, *Cypraea cinerea* Gmelin, 1791 and *Conus mus* Hwass, 1792, just to name a few.

In September, 1998, Dr. Darryl Felder, my colleague from the University of Southwestern Louisiana, went on a dredging expedition to the Flower Gardens, on board the *Pelican*, a research vessel belonging to the Louisiana Universities Marine Consortium (LUMCON), an area where two of these banks occur. The dredging was done in the general location of 27° 48.7' N 93° 03' W, in 55 to 65 m. Although Dr. Felder's interest is in crustaceans, he was kind enough to bring me over 100 pounds of coralline rubble so I could search for mollusks.

At first glance the "grunge" did not look very promising; however, after a long week of search, it yielded over 50 species of mollusks. More importantly, roughly twenty percent of the species turned out to be new records for the northwestern Gulf of Mexico. These are as follows:

- Lucapina adspersa* Philippi, 1845
- Epitonium polacium* Dall, 1889
- Hemitoma emarginata* (Blainville, 1825)
- Tryptychus niveus* Mörch, 1875
- Cosmotriphora arnoldoi* Faber & Moolenbeek, 1991
- Laevinesta atlantica* (Pérez-Farfante, 1947)
- Metaxia espinosae* Rolán & Fernández-Garcés, 1992
- Limatula subauriculata* (Montagu, 1808)
- Niveria antillarum* (Schilder, 1922)
- Globivenus listeroides* (Fischer-Piette & Testud, 1967)
- Daphnella reticulosa* Dall, 1889

It was not surprising that most of these species were of small size and therefore easy to overlook. However, I was surprised to see that *Cyclostrema amabile* (Dall, 1889), a species reported from the north-west Gulf of Mexico but considered rather rare, was among the most common species in the sediment; and that *Vexillum sykesi* (Melvill, 1925), a species that had been overlooked in the northwest Gulf until it

was reported in *American Conchologist* in 1996 from one specimen, was also common. However, the greatest surprise was the finding of a specimen of *Globivenus listeroides* in the sediment since, unlike the other records, this is not a small species.

Globivenus listeroides has had a somewhat "bumpy ride," taxonomically speaking. Fischer-Piette and Testud described "*Ventricolaria*" *listeroides* from Brazil in 1967. When Dr. E.C. Rios published *Coastal Brazilian Seashells* in 1970, he considered this taxon to be very similar to *Globivenus* (+*Ventricolaria*) *rigida* (Dillwyn, 1817), but in his later publication, *Seashells of Brazil* (1985), he placed *G. listeroides* as a junior synonym of *G. rigida*. This was the status quo for almost a decade, until Diaz and Puyana published *Moluscos del Caribe Colombiano* (1994). They considered *G. listeroides* to be a valid species and extended its distribution from Brasil to Colombia.

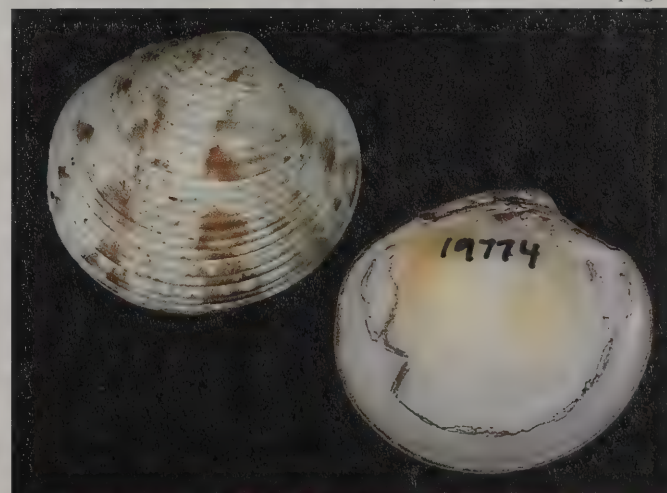


Niveria antillarum (Schilder, 1922)

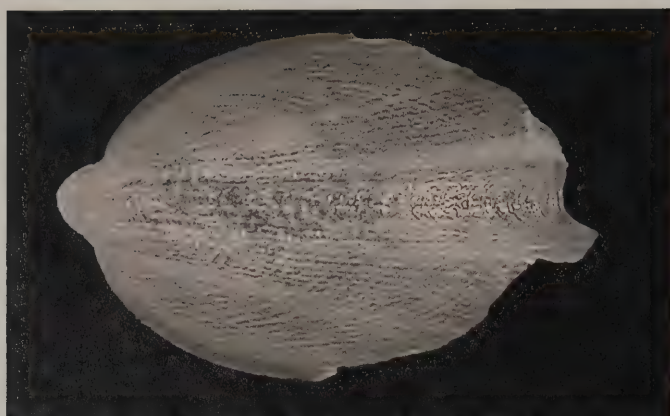
When I identified my dredged specimen as *G. listeroides* I was puzzled. I could not imagine that such a relatively large species (my specimen measures 26.3 mm) had such a great range extension, so I asked Dr. Gary Rosenberg to send me the original description. I also asked Dr. Harry Lee if he had in his collection anything that resembled *G. listeroides*. The original description sent by Dr. Rosenberg confirmed that my specimen was properly identified; and Dr. Lee's specimens turned out to be referable to *G. listeroides*. His specimens were dredged by A.T. Guest and J.R.H. Lightbourne in 300 ft. in SE Bermuda.

This species differs from two somewhat similar species, *Globivenus rigida* (Dillwyn, 1817) and "*Circomphalus*" *strigillinus* (Dall, 1902), by having concentric sculpture that can best be described as cords, without hint of lamellation. The cords are wide and somewhat "V" shaped, and are overridden by both concentric and radial incisions.

(Continued on next page)



Globivenus listeroides (Fischer-Piette and Testud, 1967)



Laevinesta atlantica (Pérez-Farfante, 1947)

(Continued from previous page)

My thanks to Dr. Harry Lee for sending material for this study, for confirming the identification of some of the dredged material and providing identification for others, and for directing me to the most recently accepted generic taxonomy. Dr. Lee has not seen the single specimen of *L. atlantica* obtained in the dredgings. I also would like to thank Dr. Gary Rosenberg, of the Academy of Natural Science of Philadelphia, and Dr. John Wise and Mrs. Constance Boone of the Houston Museum of Natural History, for providing literature essential to this article.



Limatula subauriculata (Montagu, 1808)

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COA TROPHY WINNERS

(More winners on next page)



Jake and Sylvia Dominey from the Central Florida Shell Club exhibited their new 30-foot display entitled "Coralliophilidae" at the Space Coast Shell Festival the first of this year. Both commented on how much they enjoyed collecting these beautiful little "Jewels of the Deep." This lovely display was a favorite of the many exhibitors and visitors to the show.

Opportunities for Amateurs

The University of California Research Expeditions Program (UREP) is a nonprofit organization that provides UC faculty and graduate students with paying volunteers that make "significant contributions to advancing our knowledge about topics as diverse as rainforest food webs to resource use by ancient civilizations." UREP volunteers share in the costs of field and research expenses and help collect samples and data for a given project.

One project of potential interest to amateurs is "Alien species of Monterey Bay" under the direction of Steve Lonhart <lonhart@biology.ucsc.edu>. This project is diving intensive. Volunteers will assist

Diversity and Extinction

The 29th largest state in the U.S., Alabama is fourth in animal and plant diversity. Two-thirds of America's native mussels—some 180 species—have been reported from Alabama's 77,000 miles of stream and river channels, waterways and impoundments. In addition, the freshwater snails of Alabama are the most diverse assemblage in the world—120 species! Similar species diversity exists for turtles (half of all U.S. species), freshwater fish (306 natives and 13 non-natives), and carnivorous plants 28 species of the 47 U.S. species).

Given all that richness of molluscan life, some losses to extinction are, sadly, to be expected. But Alabama has suffered extinction out of proportion to its species wealth. Almost 50% of all U.S. extinctions since European settlement have occurred this century in the Mobile Basin and the state ranks as the most extinction-prone state in the continental U.S. It has lost 98 species and has 25 more at risk. Twenty-seven species of freshwater snails alone were lost in the damming of the cobble shoals of the Coosa River; scientists consider this the single greatest extinction in the history of America.

The cause of all this destruction? The same old story: water impoundments, development, and pollution from farming and industry are eroding the diversity of ecological niches in the state. Habitats are vanishing, and with them the animals which have evolved to exploit the specialized habitats.

—From *The Pelican Post*,

Weeks Bay Reserve (Alabama) Foundation Newsletter, Fall 1998

Steve in collecting field data on the invasive whelk *Kelletia kelletii* and several of its gastropod prey species. Volunteers will dive 2-3 times per day during the 8 day project, with 2 non-diving days. This is an excellent opportunity to observe the beautiful and species rich kelp forests of Monterey Bay, a world-renowned diving destination.

Contribution is \$725, which includes meals and shared lodging, daily ground transportation to the research site, and research equipment (not including personal dive gear). The cost to the volunteer is tax-deductible and the time spent in the field helping the project leader is invaluable. There will be four 8-day sessions from July 9—August 13. For more information, contact Steve at Department of Biology, University of California, Santa Cruz, CA 95064. Phone (831) 459-4026, FAX: (831) 459-4882

COA TROPHY WINNERS

edited by Charlotte Lloyd



COA members Sylvia and Jake Dominey were the proud winners of the trophy at the Central Florida Shell Show in Orlando on September 26-27, 1998. Their exhibit, "Shells on Stamps," was a major display covering 43 feet in 24 cases. It included charts, pictures and a map showing countries of issue. This exhibit also won People's Choice and Florida Shell of the Show. Congratulations, Domineys!



The Sanibel-Captiva 62nd Annual Shell Show was held on March 4-7, 1999. It attracted over 720 feet of exhibits and 3,700 visitors. Imagine Patricia Louise Gerber's delight to win the coveted COA Trophy for her 14 foot exhibit, "Sanibel and Captiva Shells, Self-Collected." Self-described as a novice exhibitor, Patricia found the long days of shelling and identifying mollusks a scientific challenge but a joyful and exhilarating experience. Great job, Patricia! Keep up the good work.



Eight cases of shells collected in the Bahamas out-islands won Jim VunKannon the COA Award at the Sarasota Shell Show on Feb. 19-21 of this year. Jim's exhibit, entitled "Shelling Crooked-Acklin Islands," was filled with beautiful pictures and shells which delighted the many visitors to the show. Certainly well-deserved, Jim.



Dr. Tom Walker (on right) happily accepts the COA Trophy for his exhibit, "Shells Alive" at the 1998 British Shell Collectors Annual Shell Show. His exhibit imaginatively combined shells with postage stamps showing the living mollusks.

Unfortunately we do not have a photo of Peggy Williams and her COA Trophy awarded at the Sarasota Shell Show held Feb. 20-22, 1998. Peggy's exhibit, "Shelling the Southernmost Caribbean," showed shells she had collected from Venezuela. Likewise, there was not a photo available of Bob Pace who received the COA Trophy for his exhibit, "Self-Collected Marco Island Shells." Bob's exhibit included photographs and maps of the collecting areas. The award was presented to Bob at the

March 11-13, 1999 Marco Island Shell Show. Congratulations to these two fine exhibitors.

"Fossil Shells of South Carolina" was presented by Dale Stream at the 52nd Annual St. Petersburg Shell Show Expo held on February 26-28 at the Treasure Island Community Center. Dale's 16 foot exhibit wowed the judges and he took home the COA Trophy for his efforts. Great job, Dale. (no photo)

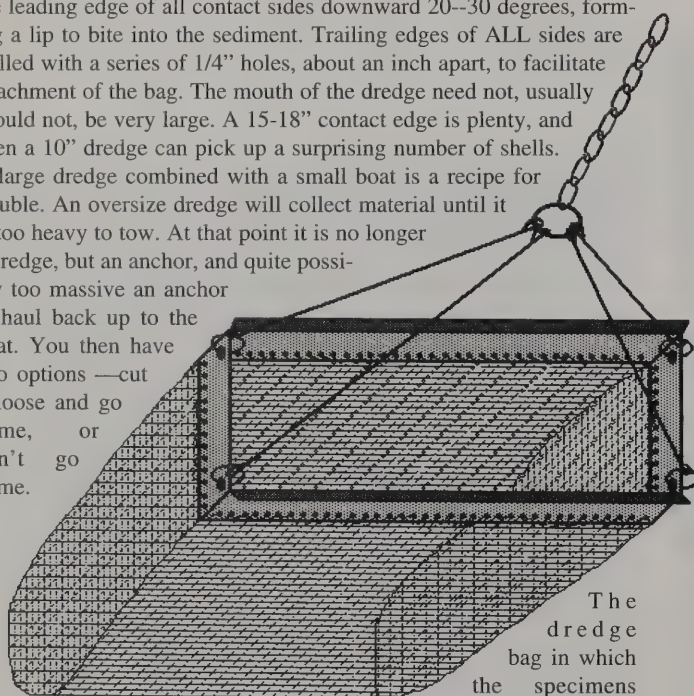
THE OLD SHELL GAME

by Paul Monfils

Extend Your Reach Beyond the Beach — Dredging for Shells

What collector, turning rocks during a minus tide, hasn't gazed wistfully seaward, imagining the treasures that might reward his efforts if only the tide would ebb another ten feet—another fifty feet! And then, with a sigh of resignation, accepted the inevitable intertidal boundaries imposed by Mother Nature, and overturned another rock. More than a few collectors though have taken up the challenge, and learned to extend their reach beyond the beach, either by scuba diving, or dredging. "Dredged at 30 fathoms" on a data slip invokes images of large commercial vessels outfitted with complex, expensive apparatus, but an individual with a small boat and some simple equipment can collect shells from depths well over 30 fathoms.

Shells have been dredged by dragging an old section of sewer pipe or a metal pail behind a boat, but a more typical, far more efficient dredge consists of a simple metal frame, pulling a 3-4 foot deep bag of netting or metal screen. Three strips of heavy gauge flat steel stock, 2-3" wide, can be welded together at the ends to form an equilateral triangle. For a rectangular frame, one pair of parallel sides should be three to four times as long as the other pair. When the rectangular dredge is on the bottom, either long side may lie on the substrate. Any one of the three sides of the triangular model may make contact. Bend the leading edge of all contact sides downward 20-30 degrees, forming a lip to bite into the sediment. Trailing edges of ALL sides are drilled with a series of 1/4" holes, about an inch apart, to facilitate attachment of the bag. The mouth of the dredge need not, usually should not, be very large. A 15-18" contact edge is plenty, and even a 10" dredge can pick up a surprising number of shells. A large dredge combined with a small boat is a recipe for trouble. An oversize dredge will collect material until it is too heavy to tow. At that point it is no longer a dredge, but an anchor, and quite possibly too massive an anchor to haul back up to the boat. You then have two options—cut it loose and go home, or don't go home.



The dredge bag in which the specimens accumulate should be

formed of rigid screen rather than soft netting, as the latter often snags and tears or hangs up on underwater projections. Mesh size is very important. The larger the mesh, the more shells will be lost through it. The smaller the mesh, the more likely it is to fill with sediment, rendering it both ineffective and extremely heavy. Ideally, most sediment should pass through the screen, while most shells are retained. Heavy galvanized steel screen with a 1/4" mesh is good for general use. However, if you want to collect the smallest shells, use finer mesh. The parts of the bag are cut out with metal shears, and "stitched" together with wire. A conical bag for the triangular dredge is made by piecing together three long screen triangles. For the rectangular frame, an elon-

gate rectangle of screen is bent around and attached to both long edges of the frame, with two side pieces then cut to fit (see accompanying illustration). The bag is attached to the frame by looping wire through the mesh of the screen, then through the drilled holes in the frame.

A solid steel ring is secured to each corner of the frame; to each ring is attached a slender steel rod or strap, approximately four feet long. Rope or chain can be substituted, but the dredge maintains optimum orientation better when these "leads" are rigid. The free ends of all four leads (three in the triangular model) are attached to a single large steel ring. A 4-6 foot length of heavy chain is also attached to the ring. This weight is necessary to ensure that the cutting edge of the dredge maintains contact with the substrate. The tow line is attached to the other end of this chain. Don't skimp on your tow line—remember, if it breaks, all is lost. Cheap cotton clothesline just won't do. Good quality manila or nylon is preferable. Rule of Thumb: tow line length = 3X water depth. To dredge successfully in 100 feet of water, you will need 300 feet of line. If you don't have a fathometer to measure water depth, use a fishing reel of braided nylon line, marked with fluorescent paint at pre-measured intervals, perhaps a different color for each 5 fathom increment. A 1 pound lead weight will take it to the bottom quickly, and depth can be read directly from the colored marks on the line.

Any boat can be used for dredging, provided it is adequate for safe navigation of the waters you will be working, and dredge size is matched to boat size. Even a skiff with oars can bring up some treasures of the deep, if the collector has sufficient personal stamina. However, dredging requires some physical exertion, even without the additional work of rowing, so a motor is vastly preferable. A larger motor will get you to the dredge site faster, but it is no great advantage during actual dredging, because you must dredge at a very slow speed. If you go too fast, the dredge will lift off the bottom and skim along above the sediment instead of biting into it. With a little experience, you will be able to tell whether the dredge is on or above the bottom, and even the type of bottom sediment, by feeling the vibrations of the tow line with your hand. After dragging for a few hundred yards or so, it's time to retrieve the dredge. This is where most of the physical labor is involved. If your dredge is not excessively large, and is not filled with rocks, you can pull it up by hand, but it's a lot of work, and a tow line of less than a half inch diameter doesn't provide much of a handhold. A small, hand operated mechanical winch is a big help here.

Emptying a dredge in a boat can make an awful mess, and trying to pick through material on deck is exhausting. The solution is a sorting board, a rigid wood plank, 1 to 2 feet wide spanning the width of the boat and overhanging each side by several inches. A block attached to the underside at each end rests against the inner surface of the boat side to prevent sliding. Each long side has a vertical lip, a smaller board about 2 inches high, extending the length of the sorting board. The two ends overhanging the water are open. Dump the dredge onto the sorting board, sit or stand (depending on the size of the boat) along the board, and pick through the dredged material in relative comfort. Simply push uninteresting material off the open end of the sorting board, back into the water. The dredge seldom contains just shells—a typical haul may include mollusks, crustaceans, echinoderms, coelenterates, annelids, fish, and other organisms, vegetation, rocks and assorted trash—so rubber gloves are a must to avert spines, stings, etc. The suspense over what the dredge may contain is of course part of the excitement of collecting by this method.

Dredging isn't just for deep water. You can snorkel over a sandy bottom a few feet deep, and see nothing; tow a small dredge along the same path and net many fine specimens concealed just below the sand. Dredging in such shallow water doesn't even require a boat! Tow the dredge by hand. Make a large loop in the tow rope to fit around your

(Continued on next page.)

(Eichhorst continued from page 24)

and envenomation—all subjects only lightly treated, if at all, in most shell books. Dr. Lee has a strong, easy to read writing style and I guarantee you will become engrossed in his material. The other article is "*Strombus oldi*—A Retrospective." This is a first hand account of the discovery and early history surrounding this still rare and sought after shell. When reviewing this site, I went back to look at this article on the web I found they had added a picture of a live *Strombus oldi*!

After the articles, scroll down the page to an area with some 20 links, each worthy of inspection. You will find a species list for Florida (several areas), a shell craft page with image and instructions, and several links to interesting images. One of these is a photo gallery of the known *Busycon* species, another of the *Personidae* family (it replaced a similar gallery on the *Ranellidae*), and other links to interesting images. These include *Strombus listeri* (Lister's Conch), *Epitonium scalare* (Precious Wentletrap), *Conus gloriamaris* (Glory-of-the Seas Cone), *Thatcheria mirabilis* (Japanese Wonder Shell), and *Papuina pulcherrima* (Green Tree Snail). Each of these images is accompanied

by a short history. There are also links to Florida *Epitonium* shells, some West Atlantic shells, other web pages, and some interesting odds and ends. This is a fun site with a lot to offer, and it completes my review of the three web pages.

Finally, a couple of cautionary notes. First, web pages are dynamic. Finding a great web page is not like buying a book and knowing the information it contains will always be as close as your bookshelf. Most sites only have a limited amount of memory available and web authors often change their page content rather than just add to it. This is good as it keeps interest up but it can be disconcerting if you remember something on a page and go back to reference it, only to find everything changed. If you really like something you find and want it available in the future; copy it to a disk or make a hard copy. Second, the web is uncontrolled. There is a lot of good information to be found and there is some worthless drivel. Thankfully most shell related web pages are good to excellent in content. Now I'm off to look at some on-line auctions. We can talk about them next time.

(Gunderson continued from page 25)

higher temperatures. Another class of proteins called chaperonins is also found in these mollusks. The chaperonins help the enzymes retain their special shapes at higher temperatures and support life.

I didn't tell the complete truth when I previously said that food was not an issue. To escape the extremes of temperature and water availability the mollusk must withdraw into its shell. This causes a distinct problem of not being able to eat. A lot of what we eat goes to support the energy demands of life. The dilemma arises of needing energy, food, simply to stay alive. Most of us are familiar with hibernation to get through the winter when food is not available. During hibernation the body slows down to conserve stored food, fat, hence energy. There is a corresponding mechanism for high temperatures called estivation. The body also slows down to conserve energy, but it does so in

response to high temperatures. The energy requirements of an organism can be monitored by measuring oxygen consumption. The higher the energy consumption the higher the energy requirements. When I have measured oxygen consumption in these supralittoral mollusks I've found it decreases during periods of high temperature. This indicates that the life processes of the body are slowing down and less energy is being used.

As far as I am concerned these supralittoral snails are real survivors and true miracles of the extremes to which life has adapted. One comical thought just struck me. Hibernating animals use fat as a store of energy. Have you ever seen an overweight snail? An overweight snail?! It'd die of embarrassment if its shell didn't fit! Surely a subject for a snail psychologist

(Coltro continued from page 26)

endemic and extremely rare species. I had the idea of starting to look for it in the middle of the grass, but the only thing that I found was a huge tarantula. You should have seen me run down the mountain! I caused an avalanche!

I went to visit Dr. Jorge Monteiro in Belém, north Brasil. He has a very nice farm in the middle of the Amazonian forest. He invited me to go there and after some hours driving over terrible roads we arrived in the middle of nowhere. The farm had some fields, beautiful lakes with translucent blue water (most of the soil in the Amazonian forest is pure fine white sand) and lots of forest.

Dr. Monteiro took me to walk inside the forest. It differs a lot from our Atlantic forest. The Amazonian forest has almost clean soil. The huge trees don't let the sunlight get to the ground and it is quite easy to walk around. I saw trees over 60 or 70 meters high and so large that it would take more than 10 men to reach around them! I tried looking under the dead leaves to find some land shells, and guess what I found? Dozens of large tarantulas! I ran away so fast that I cleared a new path.... I was lucky I went the right way—otherwise I could still be lost in the forest to this day!

About tarantulas, I was driving in Ecuador during my last trip to a small tropical rain forest near the coast between Salando and Puerto Lopez. My brother Marcus, Alfredo Bodart and I were looking for land shells. But on the way I saw, not a huge, but a humongous tarantula crossing the road. It was so big that I didn't have courage to pass by, afraid the spider could jump onto the car! I jerked the wheel away from the monster and I almost drove into the forest. When I finally stopped, many miles away, I didn't even try to leave the car; I stayed inside all the time my brother and Alfredo were looking for shells.

Even in Europe I had some bad experiences, like the time in Switzerland when I saw some *Cepaea nemoralis* in an old wall and started to collect them. Suddenly a small spider jumped in my hand and I threw away all the shells.

My last experience was in my brother's house in Miami. He bought a large house with a nice backyard. I started to look for some land shells with Ricardo and the only things that I found were spiders! I was holding up some lumber for Ricardo to look under when one little spider started to walk into my hand. I dropped the lumber on Ricardo's foot! Well, I really am a land shell lover—just don't invite me to collect them....

(Monfils continued from page 30)

waist, or tie the rope to the center of a stout pole so two people can push on the pole together, like a team of oxen.

Some dredging trips have, of course, been far more rewarding than others. However, I have never come back empty-handed, and the

intrigue of seeking out the elusive creatures of the deep, and bringing back something new for my collection which I could never have found by any other method has always made for an enjoyable and exciting outing.



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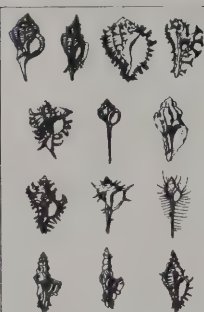
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CONCHOLOGISTS



OF AMERICA, INC.

VOL. 27 No. 3 SEPTEMBER 1999

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: *Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.*

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PRESIDENT'S MESSAGE

There was no neighing in Louisville during the 1999 COA Annual Convention. Our Louisville sluggers, Bobbie Houchin, Gene Everson, Lynn Scheu and Lori Schroeder, saw to it that everything ran smoothly. From the opening ceremony to the auctions through the banquet, this convention will rank among the best in the history of COA. Along with those attending, I wish to thank our hosts and their spouses for all of their work and support of COA. Unless you have hosted a COA convention, it is difficult to appreciate the work and planning that goes into the event. Along with the work, the hosts give up a great deal of their personal lives. So, to all who worked, thank you. From my view, it was superb!

This year we had a record number of people attending a convention for the first time. I am confident that they will be back. I think we will also find that the silent auctions made a record amount of money for COA.

For those who may be wondering about how conventions are run, here are a few thoughts to consider. 1) Anyone can host a convention. This year COA itself was the host, with only 4 members on site, and it was a success in all respects. 2) COA conventions are run by amateurs who work to make the event a professional one. 3) All work is done by volunteers. Volunteers give. They give their time and talent, often at the expense of other personal pursuits. 4) There is more than one right way to accomplish something. This is one of the things that make our conventions great...the variety of approaches to accomplishing objectives. 5) Every site is different and what works at one may not be possible at another.

So, sit back, relax and plan on attending Houston 2000, and why not volunteer to host a future convention?

Good shelling,
Linda



FLOWERS TO

Charles Cardin who is very ill with cancer. We send him our good wishes and our hopes that he has the strength to fight this disease.

Grace Johns, who has lost a young son-in-law to a heart attack. Grace lost another son-in-law less than two years ago to a tragic auto accident. Gracie, we are so saddened by this terrible news. How your family has suffered.

John Parkhurst on a quick and complete recovery from his August surgery.

Sally Payne, recovering from hip replacement surgery in late July. It was good to see you at COA, Sally!



COVER CREDITS: Charlotte Lloyd has many claims to excellence in the world of Conchology. She is Assistant Editor of *American Conchologist*, she is an experienced and knowledgeable shell collector, and she is an accomplished diver. She is also a gifted photographer of living mollusks and their shells. She photographed this tiny *Trivia nix* as it crawled across grassy coral rock during a Bahamas dive trip in late July. The shell of this lovely little shallow water species reaches just 1/8" long, so photographing it was a challenge, even for Charlotte. See more of her photographic work in this issue in the article on the 1999 Convention and in "Red Cones At Night" which recounts the Bahamas trip.

PLAN NOW FOR THE SUMMER OF 2000!

The Houston Conchology Society takes great pleasure in hosting COA 2000: A JOURNEY TO THE STARS, June 22—26 at the Wyndham Greenspoint Hotel, Houston, Texas.

Three Field Trips are schedule for COA 2000. A pre-convention field trip on Wednesday June 21 to the Brazosport Museum of Natural Science will be followed by time to walk the beach or relax by the warm waters of the Gulf of Mexico. This pre-convention field trip is a wonderful opportunity to visit with others attending the convention.

During the convention, participants will see The Strake Hall of Malacology and The Cullen Hall of Gems and Minerals at the Houston Museum of Natural Science. A post-convention field trip for a full day in Galveston is scheduled for Tuesday June 27. Activities for the day will include a tour of the Marine Biomedical

Institute at the University of Texas Medical Branch to see first hand the fascinating research being done with Cephalopods.

Are you ready to make your travel plans? Houston has two major airports positioned on opposite sides of the city. George Bush Intercontinental Airport is located to the north, minutes from the convention hotel. The Wyndham Greenspoint Hotel offers complimentary airport shuttle service from Houston's George Bush Intercontinental Airport. If you are driving, the Wyndham Greenspoint is located approximately 40 minutes north of downtown Houston near the intersection of Interstate-45 and the Sam Houston Tollway.

Come and see why Houston is more than just Longhorns and Oil. Come to COA 2000: A JOURNEY TO THE STARS. For more information about the convention contact: **Lucille Green, COA 2000 Convention Chairman, 12307 Laneview Drive, Houston, Texas 77070-2443, Phone 281-376-5630. Email <dgreen@comwerx.com>**

BOARDTALK...

From Vice-President, Betty Lipe: The annual gathering of COA Representatives at the 1999 Convention in Louisville was held early on Monday morning, June 28. It was nice to see 32 clubs represented. Many helpful suggestions came out of the meeting. A list of clubs that had responded to the survey was given to each club and an update will be made to include the clubs that filled out papers at the meeting. During the next year we hope that all the club reps will make an effort to include a tidbit about COA in their newsletters. In order to help them, the office of the Vice President will post to each of them (hopefully via email) a tidbit that they can then put in their newsletter. Representatives, be watching for it!

From COA Treasurer and 1999 Convention Treasurer, Bobbie Houchin: WALTER SAGE FUNDS REPORT: At the 1999 COA Convention the Walter Sage Fund #1 received a very much appreciated \$500.00 contribution from the Naples Shell Club for education. Also, at this Convention's Opening Ceremonies we were honored to have Walter's mother, Mary Ann Sage, who donated Walter's Shell Fabric Collection to the Walter Sage Fund #2 in his memory for education a few years ago. The convention's fabric sales, sold by Doris Underwood and other volunteers, netted \$536.32 and was added to Walter Sage Fund #2. The two Funds awarded a 1999 \$500.00 Grant, from one half the accumulated interest earned, to Rebecca M. Price, University of Chicago, for her project. The current total amount in the two Walter Sage Funds is \$15,790.94.

ADDED INFORMATION: 1999 COA Convention net proceeds from the following:

Oral Auction	\$14471.42	Raffles	812.51
Silent Auctions	9337.79	Bargain Table Shells	637.00

From Membership Chairman Doris Underwood: It's that time again! Enclosed in your magazine is the 2000 COA MEMBERSHIP RENEWAL NOTICE. Our membership is on a calendar year basis, thus dues are 'due' each January. Please check your magazine envelope before discarding it and look at the letters and date above your name. They can tell you a lot about your membership status.

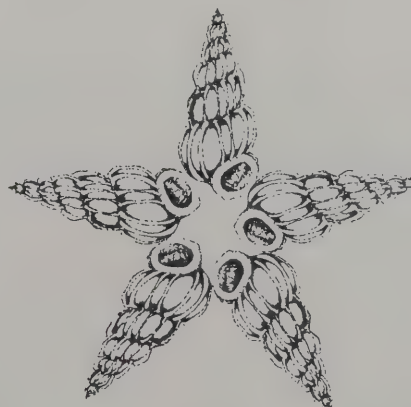
In the United States there is the option of BULK MAIL (B) or FIRST CLASS MAIL (FC). Bulk Mail is NOT forwarded, so even a temporary or seasonal change of address may affect delivery. Thus it is very important that members notify me of any change in name or address.

The date following that mail code is the year for which your dues are currently paid. Some members have paid one or more years in advance. Some have a partial credit, which will be indicated by a plus (+) sign. Labels for members in countries other than the U.S. show year paid only. If you have any questions about your membership status, please contact me: Doris Underwood, COA Membership Director, 698 Sheridan Woods Drive, West Melbourne, FL 32904-3302. (407)724-2449 or underwood@yourlink.net.

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RED CONES AT NIGHT...

Shellers' Delight

by Karlynn Morgan, Charlotte Lloyd and John Chesler

Photos by Charlotte Lloyd



Great Issac lighthouse with approaching thunder clouds in background.

For the second year in a row, Howard Roux of Naples, Florida organized a live-aboard dive trip on the 65' *Shearwater* out of Riviera Beach, Florida. [Our previous trip was chronicled by Jenny Cline (*American Conchologist*, Vol. 26, #3.)] Most participants were returnees: John Chesler, Wayne Harland, Charlotte Lloyd, Karlynn Morgan, and Howard Roux from Florida, and Ken Piech from Delaware along with Kevin Smith from California. Mark Johnson (South Carolina), Scott Jordan (another Californian), and Scott Robichaud (Massachusetts) joined us. Our venture took on an international flavor with the fortunate addition of Mariette Jearey from South Africa and Dominic Rawlingson-Plant of the United Kingdom. What a varied lot we were! From an Air Force pilot to a pathologist, a retired teacher to an accountant—we all had one thing in common: we love shells and we love to dive!

Whereas our first adventure took us south to Cay Sal, this trip was to be a broad circle from Freeport, where we would clear Bahamas Customs, continue clockwise around Bimini, and then home. Howard and Wayne had collaborated over a chart of the Bahamas and had devised a loose itinerary, dependent on our progress and what we found on our dives. They also provided us with copies of an article describing several newly-described and hoped-for *Conus* species.

For convenience, some of us gathered in West Palm Beach the evening prior to our departure. Charlotte, Karlynn and Mark spent the evening talking about last year's trip and what this trip might bring. Mark left around 10 p.m. to pick up Scott Robichaud from the airport; Scott's flight was delayed—they didn't get back until 1 a.m.! This didn't stop Dauntless Sheller Mark from calling Charlotte and Karlynn at 7:40 a.m. to see if they wanted to go out to the inlet to search for treasures—but they passed in favor of breakfast. Karlynn loaded her gear into Charlotte's van and left to pick up Scott Jordan and Dominic at their hotel at 9:15 a.m.

We all gathered dockside around 10 a.m., hoping for a speedy departure. But we had to wait for high tide to ease *Shearwater's* passage into the channel, so we spent the time renewing old acquaintances and making new ones. Everyone knew at least one other person on the trip—if not in person, then via Conch-L. Scott Jordan had read Jenny Cline's excellent article last year ["Easy Beans and Coconuts," September 1999] and had immediately contacted Howard about our

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next adventure. Dominic had inquired via Conch-L about shelling/diving trips and had been invited to join our group. Several of us had previously met Mariette at the COA Convention in Louisville. As we were waiting for everyone to arrive, Scott and Mark phoned to report they were only going to be a few minutes late. When they arrived, they proudly presented their finds, which included a medium-sized *Pleuroploca gigantea* and several nice specimens of *Strombus alatus*. "Where's Ken?" someone asked! We couldn't find him anywhere. Then a truck on the lot moved, and we saw Ken—making a last-minute call on the pay phone. We all promised each other we wouldn't lose him this year—nor anyone else, for that matter.

Everyone found a bunk, unpacked and arranged things while awaiting high tide. Our cook, Carrie, laid out a spread of cold cuts and cheeses and we proceeded to make our own sandwiches for lunch. Our group had requested John Elsner as our Captain again this year and he agreed to come out of semi-retirement and put up with this band of gung-ho shellers! He decided to take a few minutes while everyone was all in one place (something he had already found out didn't happen too often) to introduce us to the crew and the rules of the boat. (The rules were few: 1- No illegal drugs. 2- Count to ten when flushing.) Our crew consisted of Dave the Dive Master and Carrie the Cook. Also returning from last year was LeAnn, who assisted Carrie and Dave when they needed help and sometimes even steered for Captain John, to give him a quick break.

Finally! Underway! We all went to the bow so our weight would help raise the keel and we watched Peanut Island drift by. As we cleared the inlet, we all had a single thought! Nap time! We would be shelling tonight! The passage across the Gulf Stream was smooth and uneventful. (Jenny, you should have been on THIS trip!) and we cleared customs in the Bahamas in record time. Soon we anchored at Shark Reef, west of Indian Key at West End. We ate dinner and prepared for a "dusk-to-dark" dive, calling it an "adjustment" dive; in reality we were so anxious to get in the water that we couldn't wait until dark. Mariette had never seen fire coral or a scorpion fish, and asked that we point both out if we found either. We didn't. We all enjoyed a great dive at about 50' in 82°F water. Kevin, Scott Robichaud, and Ken found *Conus patae* here. John found a very nice fleshy limpet, *Lucapina suffusa*, which Charlotte wanted to save to photograph, and Mariette collected her first *Cyphoma* off sea fans.



Conus abbotti with its speckled foot and siphon.

For our second dive, we moved to the first reef edge, about 4.5 miles north of Sandy Key, a spot called Lemon Shark Reef. After a two-hour surface interval, we entered dark water with high expectations. Back aboard, we shared our discoveries, a practice we came to look forward to after every dive. Wayne found Marginellidae—*Prunum guttata* and *Prunum carnea*—along with *Turbo cailletii* and RED CONES. John found a 40 mm Red Cone, perhaps the

largest of the trip. As a matter of fact, about everyone but Mark found those Red Cones, which Wayne says are unnamed. After this dive, we spent the night at the sheltered anchorage at Sandy Key. Several people snorkeled in approximately 6'. Ken found two *Cymatium femorale*—one beauty about 8 inches long was mostly buried in sand and grass. Mark found a lovely four-inch *Tonna maculosa*, Charlotte found a very clean helmet shell, *Cassia tuberosa*, and those of us who went to bed and missed the snorkel wished we had not!

On to Jewfish Mountain Saturday morning, a very nice reef with absolutely NO SHELLS! Staying in the West End area, we went to the Sugar Wreck, a shallow water dive. Besides a *Pecten sentis*, a *Charonia variegata*, and a beautiful yellow *Strombus costatus*, we found lots of other sea life! A reef shark, two nurse sharks, lots of barracudas, and two remoras that took a real liking to LeAnn's legs! Two to three miles south of Memory Rock, we did our night dives. We found a few Red Cones (*Conus zylmanae*) here, along with a crabbed *Muricopsis zylmanae*. We also found many *Turbo cailletii*, and mitres, including *Vexillum histrio*. Wayne found a large, very nice *Calliostoma javanicum* and a very large *Conus arangoi*.



The Atlantic Triton's Trumpet, *Charonia variegata*, shows its beautiful striped tentacles and foot.

Sunday morning found us at the Lighthouse at Great Isaac. While snorkeling Dominic found a small helmet that looked like a Flame, *Cassia flammea*, but it went into the freezer so fast no verdict was ever reached! At the wonderfully photogenic Lighthouse, we all took advantage of the photo op. Charlotte began having problems with her strobe when she reconnected it after the lighthouse photo. She checked all of the batteries and all of the settings and scraped the contacts with a small file. Nothing worked. Someone suggested she clean the contacts with a piece of denim. The only denim in sight was Mariette's cut-off jeans. "Take off your pants, Mariette!" we all said at once, and fell into hysterical laughter at the astounded expression on her face. But when we had explained, she very nicely complied, as she was wearing her bathing suit under her shorts...and it worked! Charlotte's strobe was back in action and the photography proceeded without further delay. While Charlotte was shooting photos, Mark and the two Scotts were on shore collecting off the rocks. They brought back a few nice specimens of *Cittarium pica*. After we all had lunch, we anchored at the "Bicycle" Wreck near Great Isaac. Another shallow-water wreck, it got its name from its cargo of bicycles; divers have retrieved many bicycle parts from the wreck in the past. Here we found several specimens of *Latirus brevicaudatus* and *Bursa rhodostoma thomae*. Charlotte saw a huge 80-100 pound Black Grouper hiding under the wreck, which she pointed out to Kevin and Scott Jordan. We also found a Black Pistol Shrimp and a black and yellow-spotted flatworm to photograph. We surfaced to a lot of excitement onboard: a fire on



The dark eyes, orange/red mantle and delicate tentacles of this *Chlamys multisquamata* are every bit as beautiful as its shell..

the horizon! The crew had heard on the radio that a 116-ft yacht was on fire. Another nearby dive boat had responded and the Coast Guard was on the way. It sounded as if all aboard had been rescued, but the boat was lost. We had seen a large vessel at the Great Isaac Light and wondered if this were the same one. The boat burned for most of the afternoon and we were all sorry to see such a tragedy.

By mid-afternoon, we made it to the Gingerbreads, named for the multitude of underwater coral heads 40' high and covered with brown algae that give the appearance of...gingerbread, what else? We all did a daytime dive at about four p.m. None of us found anything exciting, but the habitat looked good and we eagerly anticipated sunset. One thing we all noticed was quite a few lobsters in the area. Most people did two dives that night. The bounty included two very large *Conus arangoi*, along with *Vexillum variatum*, *Vexillum pulchellum*, *Cypraea cinerea*, *Cypraea spurca acicularis* and *Muricopsis zylmanae* (a very nice specimen). Looking back at the Gingerbreads the next day, we all agreed it was a strange, eerie place: big, isolated coral heads with very lush growth—lots of soft corals and sea fans, but very few crabbed shells, no *Cyphoma* on the multitude of sea fans, very few large fish (and, as noted earlier—lots of lobster!) Still, quite a few small *Conus arangoi* (eight) were collected.



Conus richardbinghami with its tufted periostracum.

Two events during the night dives deserve some attention. Karlynn found a huge lobster. Having never "collected" one before, she pointed him out to her dive buddy, Charlotte. Having "collected" numerous lobsters over the years, Charlotte didn't hesitate to take this big boy on. They both pointed their lights at him and he started backing up, right under a small coral ledge, where he was completely hidden. But he

backed right out the other side, where Karlynn found him again about 6' away. Charlotte continued her attempts to snare him, and was eventually successful. Holding the less than cooperative creature under her left arm, she attempted to gain a better hold on him and he BIT HER! Who knew that lobsters have teeth? Charlotte can testify to the fact that they do!



Seldom seen live tusk shell with its foot extended.

Then, there was Ken. What would we do if we didn't have Ken to entertain us? When he climbed back on the boat after his first dive, he told us about his shark encounter. It was only a nurse shark, but they aren't always harmless, and underwater at night can be a different story. It seems Ken was tooling along looking for that *Muricopsis zylmanae* when something hit his dive light. He looked up and was face-to-face with the shark! He thought the shark was just as surprised as he was, and they both moved to the side to avoid each other—except they both went to the same side! Scary, but fortunately uneventful in the long run. Now, not only does Ken swim across fast current channels, he also dances with sharks!

Captain John, who'd been napping, decided after our second dive that he was up to an all-night run to our next dive site. We awoke the next morning at Six Shilling Key at the Fleeming Channel near the north end of Eleuthera. Hey! This is like being on one of those big cruise ships—you wake up every morning in a new port! During a morning dive, both John and Ken acquired *Pterotyphis pinnatus* and Wayne and Dominic found a couple of crabbed Red Cones. Kevin found an unusual Olive with a very thickened lip and a *Natica canrena* (probably) with little red dots instead of the usual brown ones. He also found a live tusk shell, interesting to all because no one recalled ever collecting a live one. The tusk, placed in a dish of fresh saltwater, reached out its foot and the resulting movement flipped the shell over. It looked as if it were trying to bury in sand that wasn't there.

Then we moved the boat to Upper Semphire Reef which yielded *Attiliosa aldridgei*, a crabbed *Muricopsis zylmanae*, *Conus flavescens*, and *Latirus virginensis*. This was a 40-45' dive in 80°F water. We then



Egg case of *Turbinella angulata* with juveniles inside.

returned to Six Shilling Key where we did several more dives during the day and night. The best finds were *Xenophora conchyliophora* and another crabbed Red Cone. Charlotte found a live *Conus stanfieldi*, and two *Conus ortneri* she was pleased to have.

Next morning, while Scott Jordan was cleaning shells on the back of the boat, he accidentally threw overboard the operculum from a nice *Strombus costatus*. Instantly, he grabbed his mask and snorkel, jumped overboard and retrieved the operculum before it sank to the bottom! After breakfast, Karlynn issued a challenge to Captain John to find some sand and grass. She wanted to collect *Cymatium femorale* and was tired of the search for Red Cones. So he moved into the channel off Six Shilling Key into what looked like grass. As it turned out, it was a seaweed similar to sargassum with a few scattered, small coral ridges—and quite a current. Charlotte tackled another lobster—no bites this time, thankfully. Mark found a nice *Conus abbotti*, about 40 mm long, the "unofficial" new World Size Record! (Are you out there, Kim Hutsell?) Scott Robichaud found a nice dead *Cymatium femorale*, but he was a very unhappy Scott when he realized he had set the tank on his collecting bag and crushed the lip of his prize!



Business end of a poised and ready "Red Cone."

With all the divers back in the boat (Yes—we were still counting heads and checking on Ken), Captain John tried again to find a nice grass patch; this time he succeeded. In 19' at 88°F, we were next to an immense grass area. Getting to it required swimming directly into very strong current, but as soon as Karlynn reached the thick grass bed, she picked up her first *C. femorale*! Within 20 minutes, she had found two more and returned to the boat. Ken found several helmet shells and Wayne collected another *C. femorale* and two *Chicoreus florifer* which he generously gave to Mariette to add to her collection. Charlotte collected a large Sea Biscuit approximately 8" x 12" and Carrie let her store it in a cooking pan under her bunk to protect it until we got to home port. Carrie brought up a strand of egg case from *Turbinella angulatum*, with a few tiny shells remaining in it. Each tiny protoconch was partially dissolved, but still visible. This egg case is quite similar to the whelk egg cases that wash up on our beaches. Scott Robichaud found a nice *Tonna maculosa* half-buried in sand. When he saw Karlynn's *C. femorale*, he went out again, vowing not to return without his own. He was successful. We collected a total of six this dive and were content to return to stalking cones.

By the time all the divers had returned, the current was gone and everyone sort of kicked back and relaxed, swimming in the warm water and playing in the sun. Charlotte and John dissected several large Heart Urchins to look at their stomach contents. They often ingest micro mollusks with all of the sand they consume. Charlotte wasn't impressed with their recent meals. The Heart Urchins she has collected off Jacksonville at 110' in a scallop bed were far more productive. But it was an interesting interlude in this quiet, relaxed afternoon.

We left Fleeming Channel behind for New Providence, anchoring at dusk near the wreck of the *Wiluri* at the southwest end of the island. New Providence was certainly pretty from the boat, but we weren't tempted to go ashore when shells were beckoning. During two dives on the *Wiluri* that night, we found six species of Ranellidae: *Charonia variegata*, *Cymatium aquatile*, *Cymatium martinianum*, *Cymatium nicobaricum*, *Cymatium occidentale*, and *Cymatium comptum*. The stern of the wreck at 50' was covered in clusters of two-inch, orange, soft coral polyps. The hull was encrusted, inside and out, with *Spondylus americanus*, most too firmly attached to be removed. Mark managed to collect a nice orange one for himself, however. The find of the night was another Red Cone, *Conus jacarusoi*, which almost everyone found. Mark told of turning over a rock when a sudden flash of green hit his dive light and streaked past him. He thought it was a moray eel, but it all happened so fast he was not positive!



Lovely and delicate thumbnail sized *Chlamys ornata*.

We were soon on our way on another long run, heading east. During the morning, we entertained ourselves cleaning shells and watching our shells' antics while they "posed" in Charlotte's aquarium. She never goes on a collecting trip without one and often "builds" it on the spot from pre-cut pieces of glass and silicone sealant. It's really small, measuring only 5" x 8", but is perfect for her purposes. She uses a strobe and a "slave" flash apparatus and a 50 mm macro lens with extensions. Kevin also photographed the shells in her aquarium with a video camera. We got a chance to watch the tape he had made of last year's adventure on this leg of our trip. We also remarked on the splendid weather we were blessed with this trip, especially when compared to our previous trip! The calm seas made for a comfortable, smooth passage.

Arriving at Morgan's Bluff on the North end of Andros Island just before lunch, we made a nice dive in 84°F water to a depth of about 80' on the wreck of the *Lady Moore*. Wayne and Dave passed the wreck and dove much deeper on the reef wall. Mark brought up a huge *Spondylus americanus*, and John Chesler found a small beauty: white with very long, curled spines; he said he simply "plucked" it from an overhead beam just inside the wreck. Then we were off again after lunch on an all day run to Bimini. We spent the time watching movies and reading, playing cards and fooling around on Captain John's laptop computer. Some of us were bemoaning our lack of e-mail access, but decided we could live without it for a few more days! By now it was Wednesday evening—only two more days left on our trip. We wanted to stretch out each precious minute.

Just before sunset we anchored at Riding Rock Reef south of Bimini, where we had done well last year. We enjoyed Carrie's wonderful meal of baked ziti and broiled lobster in a garlic butter sauce. Yum! Charlotte had Lobster Revenge, and her bitten finger didn't even bother her while she savored her dinner! Waiting for dark, we enjoyed the last rays of daylight reflecting on the smooth water surface in pas-

tel shades of pink and blue and green—we had never seen a more beautiful sunset on the water! We took Dave the Dive Master along on this dive, promising to show him how to find cones! We were all successful tonight (Yes, even Mark found a Red Cone!) Although we had found several *Conus richardbinghami* on this site last year, we apparently had left a few around for this year, too!

Thursday morning we enjoyed a nice snorkel and dive on the north side of Riding Rock. We found an assortment of shells—*Cassis*, *Strombus costatus* and *S. gigas*, *Tonna maculosa*, a beautiful *Phyllonotus pomum*, several color forms of *Fasciolaria tulipa*, *Hastula hastata*, *Terebra dislocata*, and *Turbinella angulata*. Then we moved to Brown's Key next to Ocean Key...the place we lost Ken last year. Ken retold his tale of returning to find us gone, and how he decided to swim to Ocean Key for help from the people at the "sand factory." We all learned a lesson that day and hope to never find ourselves in the same predicament. Then we got on to shell collecting. In clean, white sand we found sand dollars, moon snails, and olives. In the grass were all color forms of *Tricolia thalassicola*. Several people went up on the rocky shoreline looking for littoral species and others collected off an old wreck lying at the water's edge. John found *Vexillum puella* on the wreck. Other finds were *Conus mus*, *Calliostoma adalae*, and a tiny juvenile *Tonna maculosa*. As was our habit, we returned many of the juvenile shells and the *Strombus gigas* to the sea. On our trip we saw quite a few *Strombus gigas* in conch pens where locals had corralled them to grow a bit larger before turning them into Conch Fritters.



L. to r. John Chesler, Scott Robichaud, Mark Johnson and Scott Jordan at the stern of the *Shearwater*.

Thursday afternoon—our last night to dive—found us at Victory Reef, an awesome site last year. The seas were beginning to pick up a bit as we anchored. On two afternoon dives, we saw a nurse shark, several remoras and significantly more fish than we had noticed at other sites. As the seas picked up even more, we enjoyed our last dinner on *Shearwater* and headed for the cockpit to prepare for our last few dives. It seems we'd turned Dave the Dive Master into a shell collector—he'd found two *Conus richardbinghami*, and a crabbed *Cymatium comptum*. Even Captain John joined us and collected a Red Cone! Besides *C. richardbinghami*, we collected *Turbo caillietii*, *Attiliosa aldridgei*, *Vexillum histrio*, and *Bursa corrugata*, and Scott Robichaud even took another *Conus arangoi*. Karlynn ran into that nurse shark again and a pair of cuttlefish on both dives. During the first dive, when Mariette came to watch, they "inked" the water as they swam away. Charlotte found the cuttlefish liked her dive light, and she was able to watch them catch and eat some three-inch fish, also attracted to the light. Carrie had fed the leftovers from dinner to the fish, so thousands of small fish lingered off the stern all night long. They were fun to watch—as we ascended they moved away, only to close in again



Mariette Jearey with her shell finds after a dive.

something very nice, and the way we had held "Show and Tell" with our shells after our dives was really fun. The weather had been fantastic; Captain John calculated that we had done over 300 dives altogether on this trip—a pretty impressive number! We had lots of Red Cones—some more accurately identified than others, some not at all! Sometimes it seemed more like, "I'll show you my Red Cone and you tell me what it is!"

We took advantage of the six-hour crossing time to clean up our gear, pack and shower. Several people were still cleaning shells on the stern when we were called for our last lunch aboard *Shearwater*. While

after we had passed by. The seas increased and we rocked and rolled half the night until Captain John couldn't take it any longer and pulled anchor to head for port in Bimini. We awoke surprised to find ourselves already in port and preparing to clear Customs for the return trip home.

Then we headed for Hawksbill Reef for a final dive. We spent approximately 45 minutes at 68' wishing we were just beginning instead of ending our trip. It had been fun and relaxing. We had all met some really nice people we'd never forget. We had all collected good shells—everyone found

Captain John was at the Bimini Customs office, some of us found, at the dockside outdoor market, a tee shirt with Bahamian shells on the front. Back at the boat, Mariette admired the shirt, so Dave secretly collected a dollar from everyone for a shirt for Mariette, a gift from all of us.

Back in Florida safe and sound, we exchanged addresses and telephone numbers, and all headed for home, or hotel to await a flight home. Dominic had plans to attend the Jacksonville Shell Show and make a mini-tour of Florida. Charlotte graciously took him with her to Jacksonville. And Mark and Scott Robichaud headed to the shore to see what the high tide had left behind! This had been a marvelous shelling adventure, one we would always treasure in our memories.



Scott Robichaud cleaning a *Spondylus americanus* as we head back across the Gulf Stream to Florida.

GASTROPODA

Fissurellidae

- Lucapina aegis* (Reeve, 1850)
- Lucapina sowerbii* (Sowerby II, 1835)
- Lucapina suffusa* (Reeve, 1850)
- Diodora viridula* (Lamarck, 1822)
- Diodora dysoni* (Reeve, 1850)
- Diodora listeri* (Orbigny, 1842)
- Diodora minuta* (Lamarck, 1822)
- Diodora jaumei* Aguayo & Rehder, 1936
- Diodora variegata* (Sowerby II, 1862)
- Fissurella rosea* (Gmelin, 1791)
- Fissurella barbadensis* (Gmelin, 1791)
- Fissurella nodosa* (Born, 1778)
- Fissurella angusta* (Gmelin, 1791)
- Emarginula phixodes* Dall, 1927
- Emarginula pumila* A. Adams, 1852
- Hemitoma octoradiata* (Gmelin, 1791)
- Hemitoma emarginata* (Blainville, 1825)

Trochidae

- Tegula fasciata* (Born, 1778)
- Tegula hottesieriana* (Orbigny, 1842)
- Calliostoma javanicum* (Gmelin, 1791)
- Calliostoma adelae* Schwengel, 1951
- Cittarium pica* (Linné, 1758)

Turbinidae

- Turbo caillietii* Fischer & Bernardi, 1856
- Turbo castanea* Gmelin, 1791
- Lithopoma tectum* (Lightfoot, 1786)
- Astraliu phoebium* (Röding, 1798)
- Eulithidium bellum* (M. Smith, 1937)
- Eulithidium thalassicola* (Robertson, 1958)
- Bothropoma rubrostriatum* Rolan, Rubio & Fernandez-Garcia, 1998

Liottiidae

- Arene cruentata* (Muhlfeld, 1829)
- Arene tricarinata* (Stearns, 1872)

Skeneidae

- Haplocochlis moolenbeeki* deJong & Coomans, 1988
- Parviturbo comptus* (Woodring, 1928)

Cerithiidae

- Bittium varium* (Pfeiffer, 1840)
- Cerithium eburneum* Bruguière, 1792
- Cerithium litteratum* (Born, 1778)
- Cerithium litteratum* forma

Asemiferrugineum Lamarck, 1822

Modulidae

- Modulus modiolus* (Linné, 1758)

Turritellidae

- Turritella exoleta* (Linné, 1758)

Littorinidae

- Cenchritis muricata* (Linné, 1758)
- Nodilittorina mespillum* (Muhlfeld, 1824)
- Nodilittorina tuberculata* (Menke, 1828)
- Nodilittorina ziczac* (Gmelin, 1791)

Neritidae

- Nerita peloronta* (Linné, 1758)
- Nerita tessellata* (Gmelin, 1791)
- Nerita versicolor* (Gmelin, 1791)
- Smaragdia viridis* (Linné, 1758)

Caecidae

- Caecum floridanum* Stimpson, 1851
- Caecum cornicopae* Carpenter, 1858
- Caecum lineinctum* Folin, 1880
- Caecum imbricatum* Carpenter, 1858
- Caecum pulchellum* Stimpson, 1851

Rissoiidae

- Rissoina cancellata* Philippi, 1847
- Rissoina elegantissima* (Orbigny, 1842)
- Rissoina multicostata* (C.B. Adams, 1850)
- Rissoina princeps* (C.B. Adams, 1850)
- Rissoina sagriana* (Orbigny, 1842)
- Schwartziella fischeri* (Desjardin, 1949)
- Zebina browniana* (Orbigny, 1842)
- Zebina cordorae* deJong & Coomans, 1988

Strombidae

- Strombus costatus* Gmelin, 1791
- Strombus gallus* Linné, 1758
- Strombus gigas* Linné, 1758
- Strombus pugilis* Linné, 1758
- Strombus raninus* Gmelin, 1791

Xenophoridae

- Xenophora conchyliophora* (Born, 1780)

Calyptraeidae

- Calyptraea centralis* (Conrad, 1841)
- Cheilea equestris* (Linné, 1758)
- Crepidula plana* Say, 1822

Cypraeidae

- Cypraea acicularis* Gmelin, 1791
- Cypraea cinerea* Gmelin, 1791
- Cypraea zebra* Linné, 1758

Ovulidae

- Cyphoma gibbosum* (Linné, 1758)
- Cymbovula acicularis* (Lamarck, 1811)

Triviidae

- Hespererato maugeriae* (Gray, 1832)
- Trivia malibiana* Schwengel & McGinty, 1942

- Trivia nix* Schilder, 1922

- Trivia pediculus* (Linné, 1758)

- Trivia pacei* Petuch, 1987

- Trivia quadripunctata* (Gray, 1827)

Naticidae

- Naticarius canrena* (Linné, 1758)
- Polinices lacteus* (Goulding, 1834)

Cassidae

- Cassia flammea* (Linné, 1758)
- Cassia tuberosa* (Linné, 1758)
- Cypraecassis testiculus* (Linné, 1758)

Bursidae

- Bursa corrugata* (Perry, 1811)
- Bursa granularis* (Röding, 1798)
- Bursa rhodostoma thomae* (Orbigny, 1842)

Ranellidae

- Cymatium aquatile* (Reeve, 1844)
- Cymatium comptum* (A. Adams, 1855)
- Cymatium cynocephalum* (Lamarck, 1816)
- Cymatium femorale* (Linné, 1758)
- Cymatium labiosum* (Wood, 1828)
- Cymatium martinianum* (Orbigny, 1845)
- Cymatium muricinum* (Röding, 1798)
- Cymatium nicobaricum* (Röding, 1798)
- Cymatium occidentale* Clench & Turner, 1957
- Cymatium variegata* (Lamarck, 1816)

Tonnidae

- Tonna maculosa* (Dillwyn, 1817)

Triphoridae

- Cosmotriphora ornata* (Deshayes, 1832)
- Cosmotriphora melanura* (C.B. Adams, 1850)
- Inforis turrithomae* (Holten, 1802)
- Isotriphora peetersae* Moolenbeek & Faber, 1994
- Similiphora intermedia* (C.B. Adams, 1850)

Muricidae

- Atiliosa aldrigei* (Ustick, 1969)
- Chicoreus florifer* (Reeve, 1846)
- Dermomurex pauperculus* (C.B. Adams, 1850)

- Favartia alveata* (Kiener, 1842)

- Favartia minirosea* (Abbott, 1954)

- Haustellum rubidum* (F. Baker, 1897)

- Mancinella deltoidea* (Lamarck, 1822)

- Murexiella macgintyi* (M. Smith, 1938)

- Muricopsis oxyata* (M. Smith, 1938)

- Muricopsis zylmanae* Petuch, 1993

- Phyllonotus pomum* (Gmelin, 1791)

- Plicopurpura panula* (Linné, 1758)

- Pterotyphis pinnatus* (Broderip, 1833)

- Stramonita rustica* (Lamarck, 1822)

- Trachypollia nodulosa* (C.B. Adams, 1845)

Coralliophilidae

- Coralliophila caribaea* Abbott, 1958

- Coralliophila galea* (Dillwyn, 1823)

- Coralliophila scalariformis* (Lamarck, 1822)

Columbellidae

- Astiris lunatus* (Say, 1826)

- Astiris raveneli* Dall, 1889

- Columbella mercatoria* (Linné, 1758)

- Decipifus sixalious* Olsson & McGinty, 1958

- Nitidella nitida* (Lamarck, 1822)

- Steironepion maculatum* (C.B. Adams, 1850)

- Zafra idalina* (Duclos, 1840)

- Zafra pulchella* (Blainville, 1829)

Buccinidae

- Bailya parva* (C.B. Adams, 1850)

- Colubraria testacea* (Morch, 1854)

- Engina turbinella* (Kiener, 1835)

- Parviphos adelus* (Schwengel, 1942)

- Polia auritula* (Link, 1807)

Fascioliariidae

- Dolicholatrius cayohuesonicus* (Sowerby, 1878)

- Fasciolaria tulipa* (Linné, 1758)

- Latirus carinifer* (Lamarck, 1816)

- Latirus nematus* Woodring, 1928

- Latirus virginensis* Abbott, 1958

- Latirus angulatus* (Röding, 1798)

- Leucozonias nassa* (Gmelin, 1791)

- Leucozonias nassa* forma *Aleucozonias* (Lamarck, 1822)

- Leucozonias ocellata* (Gmelin, 1791)

(Species List continued on page 15.)

A SPINY MUREX*

by Robert Robertson

Appreciation of the beauty of a shell is often enhanced by knowledge of the animal that created it. Sometimes, as with the long spines of this marine snail, features of beauty can even be directly correlated with function.



Shell of the marine snail *Murex cabritii* Bernardi, 1859 from the Gulf of Mexico. This shell exhibits the spines much sought after by collectors. The long siphonal canal projects downward. Photo by Ross Gundersen.

Gulf of Mexico and West Indies at depths as great as 1000 feet. The specimen I collected, however, lived at a depth of only 95 feet on soft, gray, limy mud.

Related Species

Murex cabritii is one of a large family of snails sometimes called "rock shells." These are among the favorites of shell collectors. A few "rock shells" are truly rock-like in appearance, but it seems an affront to the shapely and delicate *Murex cabritii* to call it "Cabrit's Rock Shell."

A collector in the Philadelphia area has to travel much farther south than the New Jersey coast to find living spiny murexes, for they are all primarily tropical. The closest relative of *Murex cabritii* lives on the Pacific side of Central America. Ancestral fossil American species are known from Miocene rocks deposited more than 20 million years ago.

Expeditions to out-of-the-way and exotic places are one of the rewards for a biologist at a museum. In the summer of 1961, I was with a group of young geologists studying shallow water sediments off the coast of British Honduras (now Belize), on the Caribbean side of Central America.

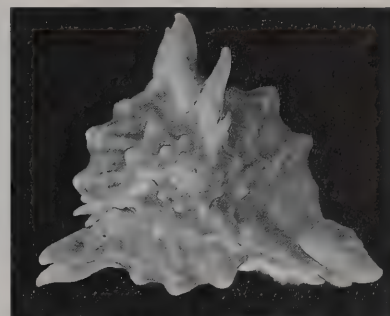
An assistant curator in the Mollusk Department of the Academy of Natural Sciences, I was eager to collect material needed for the Academy's collection of specimens from this area. My work was to collect and identify the more common snails and clams living on the reefs, and in the sands and muds.

One of the many shells that came up in a dredge dragged along the sea bottom was the spiny *Murex* shown here. Rushed for time in the field and lacking books and collections for reference, I had to wait until I returned to the Academy to learn that I had collected *Murex cabritii*—named by Bernardi in 1859 for Monsieur Cabrit, a French shell collector.

Murex cabritii is fairly uncommon in museum collections, and is found in the

Uses of Spines

Beauty in nature can be a by-product of function. The cream white shell of *Murex cabritii* is especially noteworthy for its long, straight, anterior siphonal canal, and for its many long spines. The canal and the spines probably prevent the animal from floundering in the soft mud. They are also supposed to prevent the animal from attacks by predatory fish, but fragments of fish-attacked shells are frequently found in the coastal waters of British Honduras.



This top view of the same shell shows the three spines (or series of spines) on each whorl (except near the apex). The tiny larval shell is at the apex. As seen in this view the growth of the shell is clockwise. Photo by Ross Gundersen.

Growth of the Shell

Growth of the spiny shell poses a problem for biologists, even if not for the snail. Viewed from the top, growth of the spiral shell occurs clockwise. Each time this spiral growth occurs, some of the older spines must be removed to make room for new growth around the edge of the aperture and along the siphonal canal. It is not yet known how the snail removes its old spines. They may be broken or rasped off, or they may be removed chemically.

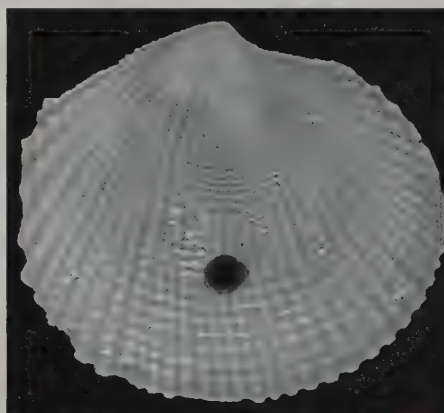
On the right-hand side of the illustrated shell, the nine lowermost spines are those grown last by the animal. The uppermost two of these are the thickest and longest and are positioned on the thickened outer lip of the aperture; the lowermost five are on the siphonal canal. Similar longitudinal series of spines are grown each time the outer lip thickens, after which growth of the shell temporarily halts.

This happens three times on each whorl (a complete revolution of the spiral). On the last whorl there are three complete longitudinal series of spines. On the earlier whorls only the single uppermost spine of each series remains. The snail removed all the spines lower on the shell, including those on the siphonal canal, to make way for the successive additions to the spiral shell.

The illustrated shell, about 1½ inches long, is only about ⅔ grown. The next stage of growth would have necessitated removal of the lowermost eight spines on the left-hand side.

Food

Murex snails are carnivorous and commonly attack living clams. Numerous clams — among them *Lucina muricata* (Spengler) — came



The hole in this shell of the clam, *Lucina muricata* Spengler, 1798, from British Honduras, was made by a snail, possibly *Murex cabritii*.

up in the dredge with *Murex cabritii*, but nothing definite is yet known about the food and methods of feeding of this *Murex*. Some kinds of *Murex* bore or drill holes through the shells of their prey. Various "oyster drills," relatives of *Murex* which also bore holes, sometimes wreak havoc in commercial oyster beds.

(Continued on page 15)

Louisville, Louavul, Luhville... Any Way You Say It, COA 1999 Was A Derby Winner!

by Lori Schroeder

It is with immense joy and great satisfaction that I am writing to share with you my first COA experience. This past February I joined the Louisville crew, Bobbie Houchin, Lynn Scheu, and Gene Everson, in planning the upcoming 1999 COA Convention held at the Galt House in Louisville, Kentucky. Plans began long before I arrived on the scene but "The Crew" welcomed me like a long lost friend. I jumped in and got to work just like so many others in the extended COA family. The pace of our work vacillated, frenetic at times and other times it seemed the convention would never arrive. All that is history now and this experience will have to be considered, in my lifetime, a milestone.



Lori Schroeder in her most recognized role, blowing the conch-horn. Winston Barney crafted the horn and hoped to perform this function, but some surgery kept him at home in Fort Worth, so Lori ably stepped into the job. Thanks, Lori! You made it a lot of fun! Photo by Charlotte Lloyd

My habitat for the week was a suite with seven roomies. A view of the historic Belle of Louisville and the Falls of the Ohio greeted us from our balcony. The living room of our suite could only be described as "Command Central." Computers and technical equipment were strewn



Every available surface was taken up with papers, props and computer gear at "Command Central, my Galt House home away from home! Photo by Lori Schroeder

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I checked into the Galt House with butterflies in my belly and lots of trepidation. Would I, as a relative novice, be overwhelmed by all the scientific types and academics presenting programs, the shell displays, and the general atmosphere? I found out soon enough that I lack the knowledge and experience so many of you possess. You do not, though, have a greater love or interest than I. I have not had the availability of a shell club or marine environment for my studies. That, hopefully, will be history as the saying goes.

over every flat surface. The first couple of days, Karlynn Morgan and Charlotte Lloyd spent many late night hours, early morning hours, anytime hours, working on registration and Bourse plans. Lists, papers, facts and figures were flying



COA President and Auction Chairman Linda Brunner.

Photo by Karlynn Morgan

everywhere. Hopefully you noticed how smoothly the convention ran? This was one big reason for it.

Registration was one of my most memorable experiences because I made some wonderful friends. This being my first foray into the convention might have had something to do with it. The registration table was packed so I made like a bee for the bargain table. It had been intimated earlier that the bargain table was quite possibly one of the best ever. I switched to my alter ego, that of Crazy Sheller. Richard Bates and David Kamms from Cleveland immediately spotted and correctly identified my status as a newcomer. The atmosphere was like sharks at a feeding frenzy. Bates & Kamms were 'musseling' me around. Elbow to elbow we scavenged for shells until the bargain hunters' tide left the tables empty. Dr. Harry Lee labeled this episode later on for me as "Random Acquisition."

1999 COA Shell Derby

The Shell Derby, held at the 1999 Convention in Louisville, KY had excellent entries. A distinguished panel of judges consisting of "the Berg Brothers," Rich Goldberg, Gary Rosenberg and Kevan Sunderberg (Sunderland) had great difficulty making up their minds, but here are their ultimate decisions. Congratulations, one and all!

Land, Fossil or Freshwater:

- 1st Place - Vicky Wall - Invasion of the Exotic Europeans: Zebra Mussels
- 2nd Place - Doug Shelton - *Epioblasma*: A Vanishing Genus of America's Freshwater Pearly Mussels
- 3rd Place - Tom Grace - *Cristaria herculea*

Louisville Unlimited:

- 1st Place - Travis Payne - Shells on Steroids (better known as "Disgustingly Beautiful Shells")
- 2nd Place - Marilyn Lucarelli - Muricidae: Limited Editions.
- 3rd Place - Doug Shelton - Lost and Found: The Rediscovery of Lost Collections of the Late Harvey Bullis

Self-Collected:

- 1st Place - Gene Everson - World Wide Self-Collected Shells
- 2nd Place - Peggy Williams - My Favorite (Secret) Shelling Spot in Sarasota Bay

One Something:

- 1st Place - Peggy Williams - Chitons
- 2nd Place - Tom Grace - Worldwide *Haliotis*
- 3rd Place - Bruce Neville - One Name: Peter Freidrich Röding

One Case:

- 1st Place - Harry Lee - Seldom Seens
- 2nd Place - Terry Davis —
- 3rd Place - Tom Grace - 2 *Conus arangoi* color forms

Single Shell:

- 1st Place - Marilyn Lucarelli - *Babelomurex (Tarantellaxis) juliae*
- 2nd Place - Bert Floyd - *Hexaplex fulvescens*
- 3rd Place - Charles Owen - *Bolma massieri*

Shell of the Show:

- Harry Lee - *Cymbiola chrysostoma*

Self Collected Shell of the Show:

- Gene Everson - *Chicoreus eversoni*

People's Choice:

- 1st Place - Tom Grace - Worldwide *Haliotis*
- 2nd Place - Travis Payne - Shells on Steroids

After stashing my newly acquired specimens I headed over to the raffle table. The ever-smiling Shelley Zantop and irresistible Nicholas Zantop greeted me. A pair of clever con artists is what these two are. I couldn't get away; they strong armed me until I bought lots of tickets. It wasn't bad though—the raffle items were great and so generously donated to COA. Donald Dan donated a beautiful albino chambered nautilus, Richard & Lynn Scheu gave a wall hanging with the Life Stages of the Oyster as its theme, Gene Everson gave a *Conus gloriamaris*, and my favorite, a coffee table made by Dave Kempfer filled with shells donated by Showcase Shells. Deciding where to put the tickets was difficult indeed.

The Friday before the convention Lynn Scheu received a package from Fort Worth, Texas. Enclosed was a Horse Conch Horn crafted by Winston Barney. He had intended to blow the horn at convention but was sidelined due to upcoming cataract surgery. I opened the convention by blowing the Horse Conch. A way to convene everyone, and it actually worked! Either that or shellers are hearing impaired and would have convened anyway...Come to think of it, I did see a lot of the general public standing around with their mouths hanging open, and definitely not converging on our meeting rooms!



A delighted Ross Gundersen holds the Celtic harp he created and donated to the 1999 Auction. Beside him is Tina Petway, just as delighted that she had the winning bid. Can we have another look at that beautiful harp again in Texas next year, Tina? Photo by Charlotte Lloyd

dog ate her homework, she wasn't tall enough! Let me set the record straight here and now. She took the microphone like she'd been born with one, and proceeded to exude life and humor throughout the room. I've never seen anyone turn it on like she does, and watching her was a sight to behold.



The Conch-L Party: from left, foreground: Horatio Buck, Don Barclay and Paul Calloman; second row: Vicky Wall, Helen Madow, Bruce Neville, Carole Marshall, Ardeth Hardin and Marian Deuel; back row: Gary Coovert, Betty Lipe, Bob Lipe and Homer Rhode. Photo by Charlotte Lloyd

Once the convention began, I was busy with door prizes and that blasted Conch Horn. My door prize committee of Travis Payne, Nicholas Zantop, and Betty Jean Piech were a great team. I consider meeting Betty Jean a special blessing. For she is the 'natural' comedienne of Conchologists of America. I asked Betty Jean to work the microphone and call out numbers. She was the obvious choice as I didn't think she wanted to be a runner. She at once declined saying she couldn't hear well, she just had leg surgery, her

All the programs were informative, cleverly entertaining, and, OH! those beautiful slides. I have one complaint here: I wanted to take notes but quickly found this impossible in the dark. Kudos to Dr. Gary Coovert who so generously provided handouts and extra literature for us. Tom Watters emceed all the programs and acted as the ever-vigilant timekeeper. He interjected his special dry brand of humor when introducing programs, and always seemed to know just what to say and how to put everyone at ease. I enjoyed that.

My background in Conchology is limited. I have spent sporadic episodes in my life devoting time to my shells. It wasn't until September 1997 that I came across COA and Conch-L via the internet and awakened my dormant passion. It's a difficult hobby to pursue when you're going at it solo. With this in mind, can you imagine how exciting it was for me to experience my first shell show. All the entrants were winners in my book. But since this was COA and a Shell Derby there had to be winners. My favorite and the peoples' favorite was Tom Grace's display of "Worldwide *Haliotis*." One of my roomies, Vicky Wall, won for her display of zebra mussels.

The silent auctions went on during the programs and other activities. I was unsuccessful during the first two but caught on eventually. I have to admit I was privileged to see the items ahead of time when Lynn, Bobbie and I had to go through and tidy things up. (Heat and humidity can really wreak havoc on boxes of shells with little paper labels.) They wouldn't let me purchase floor samples ahead of time so I called dibs. When that didn't work I devised another scheme so that I would be successful. I cannot divulge my methods; let's just say I had my fair share of winning bids.

Another interesting aspect of the silent auctions was congregating and sharing 'Conchological' fellowship. Hattie Smith introduced me to Doug Shelton and we initiated plans for Alabama to host COA someday? Maybe? Hattie gets my vote for the attendee with the best accent. Hattie, you have to teach me how you do that drawl! Howard and his beautiful wife and daughter were always close by. I would have made a donation to COA in honor of Howard's daughter if only I could have had one hug from her. Following Ruth Ann Sparlin around, I threatened to bid on everything she did. She in turn gave me one of her looks over the glasses. I was only kidding, Ruth Ann!

The Welcome to Louisville party at Actors Theatre was wonderful.



Nicholas Zantop wearing one of his several hats! He's advertising Gene Everson's COA baseball caps while selling raffle tickets and t-shirts. Nicholas was also one of our door prize team. Photo by Richard Scheu

Patrons of the 1999 COA Convention

The following people made financial contributions to help insure the success of the 1999 Convention. We sincerely appreciate their generosity.

Bruno de Bruin
Linda and Jim Brunner
Jose and Marcus Coltro
Gene Everson
Bobbie Houchin
Patty Jansen
Karlynn Morgan
Sally Payne

Travis Payne
Guido Poppe
Ann and Homer Rhode
Jean and Charlie Roe
Suzanne B. Rogers
Lynn and Richard Scheu
Ruth Anne and Derry Sparlin
Doris Underwood



Caught ya! Kim Hutsell and Tom Eichhorst sneak an advance peek at "The Also Rans - The Best Silent Auction Ever" and a guilty-looking Steve Coker grins happily at photographer Charlotte Lloyd.

vantage was excellent and the air was lots cooler. The party favors, shell fortunes with BourseBucks included, were great fun. Conch-L's very own Art Weil made up the fortunes and a clever wit he proved to be.

Richard Scheu provided me with one of the funniest moments at convention during the Welcome Party. I was standing at the rail up in the balcony when I spotted Richard, on his knees at a very nice-looking woman's feet, cleaning up her spilled plate of blackberry cobbler. I stood there admiring him and this reminder that chivalry isn't dead after all made me think how lucky Lynn is to have such a great husband. Later on when I came down the stairs and caught up with Richard I mentioned this heroic deed. He looked at me with a straight face and said, "Actually, it was my plate that spilled! I was rather frantically cleaning up the mess it made for fear it would stain the lady's dress and she'd sue me!" "So much for Chivalry!"

One very special couple, Ann and Homer Rhode, staffed COA's hospitality suite in the mornings. Because I would rather catch a few extra minutes of sleep than worry about breakfast, I didn't make it till the last day and I surely regret not going sooner. I had just thought, "I don't want to be around a crowd when there is free food." When I finally walked into the suite I was amazed; it was more like a social get together than a feeding frenzy. What a wonderful way to start the day.



Charlotte Lloyd takes a moment out of her busy round of duties as convention photographer, bourse chairman, silent auction chairman, and furniture mover to pose for a picture. Flanking Char are Californians Bill Cargile and Kim Hutsell. Kim was on hand to measure shells for his Registry of World Record Size Shells. Photo by Lori Schroeder

So many people attended that the rooms got a little warm, but whoever thought up those yummy desserts had a brainstorm. I do not have an acquired taste for Kentucky Bluegrass music even though I have lived here most of my life. I did, however, enjoy the Kentucky Blues, the band hired for our entertainment. Since the main floor was packed I meandered upstairs to where another dessert buffet was set up. The few of us who discovered the upstairs had our own little private area. The

Another fun and exciting outing was the dinner cruise aboard the Star of Louisville. The boat was filled to capacity, and there was lots of scrambling around for seats. Every once in awhile a stroke of good luck knocks on your door. This happened to me on the boat. Our table was the first one invited to go

Donors

We extend a warm thank you to the following people, businesses and organizations for their generous contributions which helped so much to make the 1999 Convention a success. If you donated to the 1999 convention and don't find your name on this list, please be assured that the omission was inadvertent, and probably due to faulty record keeping on the part of the editor. We send you a very special thank-you. Your contribution was valued and appreciated.

Mary Ellen Akers, Randy Allamand, Atlanta Shell Club, Bank One, Bardstown Nelson County Tourist and Convention Commission, Barbara Barfield, Belle of Louisville / Spirit of Jefferson, John Bernard, Carol Bodine, Dr. and Mrs. Donald T. Bosch, Bristol Bar and Grill, Brown, Foreman Corporation, Jim and Linda Brunner, Cardinal Printing, Caesars Indiana "Glory of Rome" Casino, Chip and Edie Chippeaux, Churchill Downs, Jose and Marcus Coltro, Jean Cooper, Bruce W. Crystal, Donald Dan, Bruno de Bruin, Delaware Museum of Natural History, Peter Demertzis, Glenn and Marion Deuel.

Bev and Al Deynzer, Phyllis Diegel, Phil Dietz, Sylvia Dominey, Dudley Everson, Gene Dudley Everson, Alan and Ethel Gittleman, Sue Hobbs, The Galt House Hotel, Richard Goldberg, Alan Goldstein, Bob and Jo Granda, Lindsey T. Groves for the Malacology Section of the Natural History Museum of Los Angeles County, Ross Gundersen, Ardeth Hardin, Barbara and Ed Haviland, Bobbie Houchin, Barbara Hudson, Mariette Jearey, Dave Kempfer, Kentucky Center for the Arts, Jose Leal (Bailey-Matthews Shell Museum), Fred Leonard, Bob and Betty Lipe, Charlotte Lloyd.

Louisville Convention Bureau, Louisville Stoneware, Carole Marshall, Mique's Molluscs, Molly Malone's Irish Pub, Paul Monfils, Karlynn Morgan, Lynn Nathanson, National City Bank, Rosi Neuffer, Helmut Nisters, Norton Health Care, Robert and Alice Pace, Carmen Painter, Ed Paul, Marge Peach, Betty Jean Piech, Don Pisor, Republic Bank, Homer and Ann Rhode, Trevor Roberts, Jean and Charlie Roe.

Suzanne B. Rogers, The G. Rogers Collection, Bonnie Rosenberg, Mary Ann Sage, George Sangioulouglou, Gloria Scarboro, Lynn and Richard Scheu, Mary Schindler, Olive Schoenberg-Dole, Fred Schroeder, Lori and Jeff Schroeder, Hattie Smith from the Collection of Celeste Wine Shippey, Ruth Ann Sparlin, Dan Spelling, Jordan Star, Star of Louisville, Larry Strange, Suncoast Conchologists, Kevan and Linda Sunderland, Chris Takahashi, Glenn Tolman, Doris Underwood, Ben and Josy Wiener, Fran Wright, Don and Dottie Young, Nicholas and Shelley Zantop, Bob and Gail Zimmerman.

through the buffet. The buffet was super, I definitely enjoyed the food more than I thought I would. The Steamboat round of beef was cooked to perfection and there was all the peel-and-eat-shrimp a person could devour. After dinner there was plenty of time and space to walk around the boat and enjoy the water and Louisville scene. I heard many tables laughing and enjoying jokes. This atmosphere spread throughout the entire boat and made the dinner cruise fantastic.

Tuesday morning I was scheduled to go on the Falls of the Ohio Fossil trip (A Devonian age fossil bed), but couldn't wake myself. I guess all that partying on the dinner cruise left me exhausted. But everyone I talked to loved it so I plan on going myself one of these days.

Tuesday afternoon the "creme de la creme" of shells hit the auction block at the 1999 COA oral auction. As I walked around during the auction preview drooling over the donations, I couldn't keep from wondering



Holly and Gary Coovert from Dayton, OH examine a table of shells at the Bourse.

Photo by Richard Scheu

what all these beauties would go for. Speaking for myself only, I was very intimidated and knew I was out of my league. So I left before the auction started and went to help the workers in the silent auction room. After awhile Karlynn Morgan convinced me to go see the auction. I didn't take my auction list or bid paddle provided in the registration packet, just slipped in and sat in one of the last rows. It didn't take long for my adrenaline to start pumping. A bidding war was in progress and watching the paddles shoot up and remain fixed was awesome. David Kamms saw me sitting alone and came over to join me. David, who is very enthusiastic, gave me a play-by-play, much like a commentator at a sporting event.



Convention Master of Ceremonies Dr. G. Thomas Watters at the Bourse. Photo by Richard Scheu

After a couple of hours I noticed that occasionally a shell would be offered in my price range. I got antsy-pants, an itch in my crawl, or whatever, and broke down and got a bid paddle from Bobbie Houchin. I hesitantly waved my paddle a couple of times and what a thrill that was! I was hooked now. Kamms was absolutely no help at all; if the truth be known, he was goading me into bidding. After a very long segment of pricey shells another shell, a *Conus*, seemed to stir very little interest. I started thinking to myself, "Here's your window of opportunity, so go for it!" My sensible side said "Nobody wants it. It must be a terrible specimen." My impetuous side won out and the *Conus* is now in my collection. The best part of all was when my husband, Jeffrey, came into the auction room and discovered I had been bidding. The color suddenly drained from his face and I had to show him gently to a chair. It was a priceless moment.

It's a good thing I slept in Tuesday morning because Tuesday night was the Conch-L party hosted by Karlynn Morgan, Lynn Scheu and Linda Sunderland. Our suite was packed full and everyone looked to be having a great time. The company was as nice as the snacks. If you missed out on the ham salad then you missed out on a treat, and Linda Sunderland's clam dip was to die for. After joining COA and Conch-L two years ago, I found it was especially nice to see a face and put a name with it. We all gathered around the room so that we could intro-



Art Weil shills *Shell Shocked* to Lynn Gaulin while Maria Fontina Angioy looks on. Photo by Richard Scheu

duce ourselves. Art Weil had us all practically rolling on the floor when he introduced himself as Helmut Nisters. Helmut, it was good of you to come, if only in spirit. I am fortunate that my husband not only tolerates my passion for shells but is quite supportive. He has used his programming skills to develop a database for my collection; we call it Seabase. He was glad to share it with others at the Conch-L party.



Bob and Jane Ashfield tend Shellmark Press' very colorful bourse table. Photo by Chris Takahashi

I have another memorable moment etched into my memory from convention. I never met Randy Allamand but his Random Act of Kindness was so touching I have to mention it. He got into a bidding war with another astute collector over a rare shell that was misidentified as a common one. Randy's bid was successful and instead of buying the specimen he returned it to the silent auction committee for resale in the oral auction, where I hear it brought about \$1,000.00.

What in the world is all the din concerning World Record sizes? I never once felt my shells could be inadequate. Was this something cooked up by the male species? I didn't know women were that hung up about sizes. But then I met Kim Hutsell and he set the record straight for me. His book, *Registry of World Record Size Shells*, is a



Some of the Convention crew at the banquet: from left, Jeff and Lori Schroeder, Ann Buddenhagen, Vicky Wall and Convention Registrar, Karlynn Morgan. Photo by Charlotte Lloyd

wonderful and useful tool for collectors. I am the proud owner of the number one signed copy for 1999. Eat you heart out, Gene!! All kidding aside, Kim was so nice to me throughout the entire convention. He always had a smile on his face and a ready hello. I am so new and he really made me feel welcome.

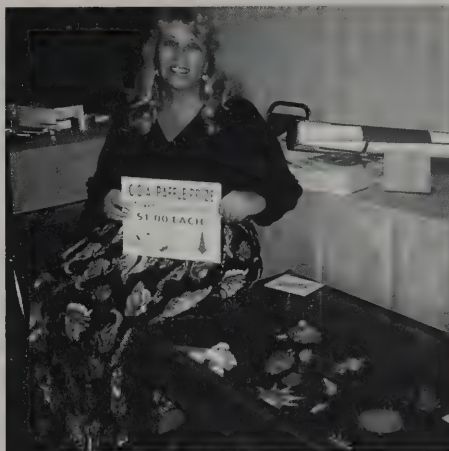
All I heard about all week was "Wait till you see the Bourse. You're not going to believe how wonderful it is." You won't believe this but I missed the opening of my first bourse. I sneaked away with Kim Hutsell, Richard Scheu, and some other lucky antique shoppers he had just picked up and went out for some Kentucky barbecue for lunch. When we arrived back at the hotel I picked up my copy of Rice's Prices and beelined for the Bourse where I made the rounds. It was truly an overwhelming experience. The displays and shells were just unbelievably gorgeous. The very nature of competition for shells and the smell of money everywhere made the closeness and camaraderie I had felt earlier at the convention seem a little distant. But Nicholas Zantop pulling me aside to look at something great he found made up for it and so did the way Richard Bates surprised me with a gift of a *Cypraeacassis testiculus* I so desperately desired.



The 1999 Convention Committee, dubbed "The Louisville Sluggers": from left, Convention Treasurer Bobbie Houchin, Gene Everson and Lynn Scheu. Photo by Charlotte Lloyd

After all the excitement of the Bourse I eagerly looked forward to the Banquet. A true Kentucky Derby tradition, the Great Balloon Race, was this year's theme. Many willing workers contributed to the decorations and setup. The banquet room was filled to capacity and everyone looked their Sunday best. There was an electric buzz about the room, a feeling that this night was going to be a very special one. Our meals were served promptly and efficiently. My table was unanimous in their choice of Roast Pork Loin, but the Pacific Rim Chicken looked equally delicious, I can't imagine many morsels were left on any plates. Dessert was a scrumptious, white chocolate mousse that melted in your mouth. We were then given a piece of Makers Mark Bourbon Chocolate for a treat. A round of applause was given to the hotel staff in appreciation for the banquet's excellent service.

Lots more activities were to come, but first, the last of the door



A very lucky Carole Marshall (Did you see that huge string of raffle tickets she bought?!!) poses with her big win, the shell coffee table designed and built by the talented Dave Kempfer and filled with shells by Al Deynzer (Showcase Shells). Aren't you glad you drove to the convention, Carole? Photo by Carole Marshall

prizes were given out. The winner of the Maker's Mark Run For the Bourbon was announced much to the chagrin of Shirley Pallidino. Suzi Rogers was the winner with the most correct answers. I pains me to mention this but the raffle items were given away next and Carole Marshall won my table. My only solace is, she's such a wonderful lady that I know she'll love my table and give it a good home.

President Linda Brunner stepped up next to make some closing remarks and

gave lauds to everyone for making this year's convention a successful one. Special gifts were given as tokens of appreciation to members of the committee and others whose outstanding contributions could not be overlooked. Then the 4,000-year-old Sheller arrived for a visit. Rich Goldberg interviewed him on some of Life's most important questions. Through the years, his wisdom and insight have enlightened many a sheller.

The highlight of the evening, the keynote speaker, was Dr. Emily Vokes, Professor of Geology, Emerita, Tulane University. Tom Watters looked like a kid in a candy store as he was introducing Dr. Vokes. His excitement was contagious and when I gazed upon him during Dr. Vokes' program, a fire alarm could have been sounding and he would have been totally oblivious. Her program with slides captivated the audience. The topic of shells in archeology of the South American Indians was fascinating and left me wanting more. If it's possible to demand an Encore! after a banquet program then Dr. Vokes could easily have had a dozen curtain calls.

As the convention came to an end, and they all do, I spent quiet reflective moments looking around at the banquet and thinking, "Where have you been all my life?" Shellers are great people and COA is great too! We all sat at our tables with friends and new acquaintances, sharing a nice meal and good conversation. And here I was, thinking to myself the entire time, "I want to do this again...."



Our esteemed Banquet Speaker, Dr. Emily H. Vokes, delivered a fascinating program on shells and archaeology. A big Thank-you from all of us, Emily! Photo by Charlotte Lloyd

Convention Volunteers

Convention 1999 Louisville, COA's 28th Annual Convention, was a great success in spite of the fact that there was no local club on the spot to host it. There were just three COA board members and a fourth willing soul, Lori Schroeder, to organize the event. COA 1999 was billed as COA's Own Convention, and indeed, these four could not have done the job, let alone made it such a great conchological and financial success without the willing volunteers who stepped forward from the COA board and from among the membership! There follows a partial list of those people who worked on the 1999 Convention. Some of those names you see below are those of people who saw a need and just stepped in and filled that need. Any such listing is bound to omit some willing and hardworking volunteers, and so we publish this randomly organized list for the perusal of the membership with apologies and grateful thanks to those whose names may have been omitted.

Gene Everson, Bobbie and Earl Houchin, Lynn and Richard Scheu, Lori and Jeff Schroeder, Charlotte Lloyd, Linda and Jim Brunner, Karlynn Morgan, G. Thomas Watters, Howard Roux, Betty Jean Piech, Travis Payne, Nicholas and Shelley Zantop, Hattie Smith, Sue Hobbs, Mariette Jearey, Dave Green, Doris Underwood, Carol Bodine, Ann and Homer Rhode, Carole Marshall, Kim Hutsell, Doug and Carrie Shelton and family, Beverly Deynzer, Phyllis Gray, Terry Davis, Bob and Betty Lipe, Gary Rosenberg, Rich Goldberg, Kevan and Linda Sunderland, Ann Buddenhagen, Vicky Wall, Tom Eichhorst, John Baker, Steve and Wanda Coker, Bruce and Kurt Bradley, Barbara Elliott, Hank and Mary Ruth Foglino, David Kamms, John Baker.

Marilyn Lucarelli, Fay Mucha, Sherlee Palladino, Jean and Charlie Roe, Ruth Anne and Derry Sparlin, Ray Wichus, Jean Wright, Elaine Zelmon, Chip and Edie Chippeaux, John Bernard, Lucy Clampit, Horatio Buck, the Coltros, Margarette Perkins, Dave and Jean Kempfer, Rich Kirk, Bruce Neville, all the people who helped with the balloons for the banquet, everyone who entered the Shell Derby, and all those wonderful presenters of programs! Thank you all!

(Robertson continued from page 9)

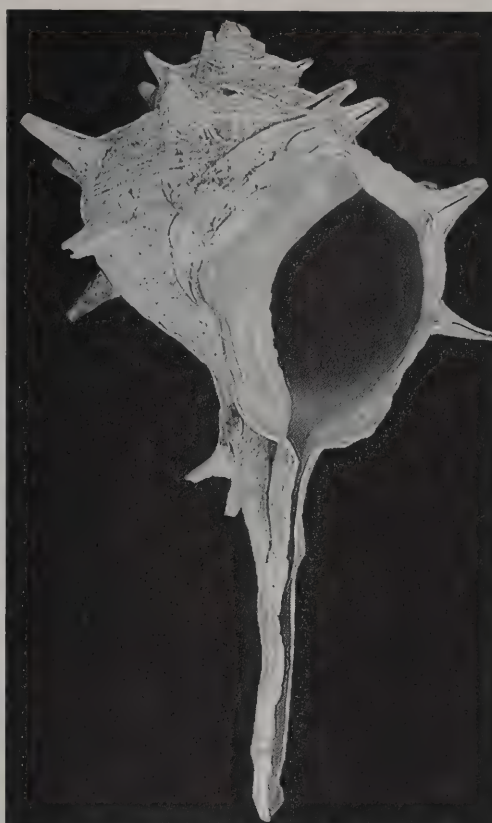
Method of Drilling

Like most snails *Murex* has a radula: a ribbon bearing rows of teeth with which food is rasped and drawn into the mouth. For many years biologists had disagreed about how *Murex* makes holes through primarily calcareous shells—mechanically, with the teeth of the radula? Or chemically, with an acid dissolving the calcium carbonate? The radular teeth are never worn enough to indicate that they alone were used to drill, and an acid has never been found.

Recently, the American zoologist Dr. Melbourne R. Carriker has shown that boring is both chemical and mechanical. First, a non-acid secretion dissolves or softens some of the calcareous crystals embedded in the horny, protein-containing matrix, and perhaps also breaks down some of the matrix too. Then the radula abrades the weakened and softened area of the shell. Persistent and alternate chemical and mechanical attacks result ultimately in a hole, through which the *Murex* can reach the soft body of its prey. Additions to knowledge lead to further questions: Does *Murex* remove its old spines with the same means that it uses to drill holes in other shells? Biologists do not know the answer yet.

Dye

Many, if not all, species of *Murex* secrete a fluid that at first is pale yellowish and a minute or so later becomes reddish or purplish. Apparently the color change is caused either by light or by contact with oxygen. The secretion seems to be noxious to other animals and



Murex brandaris Linné, 1758 secretes a fluid that was used as a dye, Tyrian purple, by the Phoenicians, Greeks, and Romans. This shell is about 3 inches long. Photo by the author

probably is used by *Murex* to overcome its prey or to defend itself from other predators. The secretions from Mediterranean *Murex* snails were the chief source of Tyrian purple dye, used by the Phoenicians, Greeks, and Romans to color fabrics.

One method these people used to extract the dye was to immerse the bodies of numerous snails in salty water in a specially excavated cavity on a rocky shore; then they left the increasingly putrid mess for several days to be acted upon by the sun. Finally, they concentrated the dye by boiling the liquid extract in a metal vessel.

Appreciation of the beauty of the shell is often enhanced by knowledge of the animal that created it. Sometimes, as with the spines of *Murex cabritii*, features of beauty can even be directly correlated with function. A person ignoring one or the other aspect, be he a shell collector or a studios biologist, surely misses something.

An afterthought 34 years later:

The marvelous molluscan mantle not only can grow (secrete) one or more shells (bivalves and chitons), but on occasions can also dissolve parts of a shell (e.g. the interior of a cone shell). I now think it likely that *Murex* dissolves the base of the spines necessary for its further shell growth, instead of rasping them off solely with its radula.

First published in *Frontiers* in 1965, a magazine of natural history 29(4): 100-103, published by the Academy of Natural Sciences of Philadelphia, and reprinted here with the kind permission of the ANSP.

(Species list continued from page 8)

Nassariidae

- Nassarius albus* (Say, 1826)
- Nassarius antillarum* (Orbigny, 1842)
- Nassarius kaicherae* deJong & Coomans, 1988

Mitridae

- Mitra barbadensis* (Gmelin, 1791)
- Mitra nodulosa* (Gmelin, 1791)
- Mitra semiferruginea* Reeve, 1845

Costellariidae

- Thala floridana* (Dall, 1884)
- Vexillum arestrum* (Rehder, 1943)
- Vexillum dermestinum* (Lamarck, 1811)
- Vexillum histrio* (Reeve, 1844)
- Vexillum puella* (Reeve, 1845)
- Vexillum pulchellum* (Reeve, 1844)
- Vexillum sykesi* (Melvill, 1925)
- Vexillum variatum* (Reeve, 1845)

Olividae

- Oliva reticularis* Lamarck, 1811
- Oliva bifasciata* Weinkauff, 1878
- Olivella acteocina* Olsson, 1956
- Olivella dealbata* (Reeve, 1850)
- Jaspidella blanesi* (Ford, 1898)

Turbinellidae

- Turbinella angulata* (Lightfoot, 1786)

Harpidae

- Morum lamarkii* (Deshayes, 1844)
- Morum oniscus* (Linné 1767)

Volutilidae

- Enaeta cylleniformis* (Sowerby I, 1844)

Marginellidae

- Hyalina pallida* (Linné, 1758)
- Prunum carneum* (Storer, 1837)
- Prunum guttatum* (Dillwyn, 1817)

- Prunum roosevelti* Bartsch & Rehder, 1939
- Volvarina albolineata* (Orbigny, 1842)
- Canalispira hoffi* Moolenbeck & Faber, 1991
- Dentimargo reducta* (Bavay, 1922)
- Granulina hadria* (Dall, 1889)
- Granulina ovuliformis* (Orbigny, 1841)
- Persicula catenata* (Montagu, 1803)

Conidae

- Conus arangoi* Sarasua, 1977
- Conus attenuatus* Reeve, 1844
- Conus jaspideus* Gmelin, 1791
- Conus jaspideus* forma verrucosus Hwass, 1972
- Conus mindanus* Hwass, 1972
- Conus mus* Hwass, 1972
- Conus patae* Abbott, 1971
- Conus regius* Gmelin, 1791
- Conus richardbinghami* Petuch, 1992
- Conus sahlbergi* da Motta & Harland, 1986
- Conus jacarusoi* Petuch
- Conus zylmanae* Petuch
- Conus flavescens* Sowerby II, 1834
- Conus daucus* Hwass, 1972
- Conus abbotti* Clench, 1942
- Conus stanfieldi* Petuch

Turridae

- Conus ortneri* Petuch
- Conus* species 1
- Conus* species 2
- Terebridae**
- Hastula hastata* (Gmelin, 1791)
- Terebra dislocata* (Say, 1822)
- Terebra biminensis* Petuch, 1987
- Turridae**
- Agathotoma candissima* (C.B. Adams, 1845)
- Buchema bridgesi* (Dall, 1919)
- Crassispira cubana* (Melvill, 1923)

- Crassispira* species 1
- Crassispira* species 2
- Crassispira nigrescens* (C.B. Adams, 1845)
- Drillia cydia* (Bartsch, 1943)
- Fenimorea fucata* (Reeve, 1845)
- Fenimorea halidorema* Schwengel, 1940
- Fenimorea janetae* Bartsch, 1934
- Glyphoturris rugirima* (Dall, 1889)
- Ithycthyara psila* (Bush, 1885)
- Ithycthyara rubricata* (Reeve, 1846)
- Kurtziella dorrilliae* (Reeve, 1845)
- Mitrolumna haycocki* (Dall & Bartsch, 1911)
- Pilsbryspira albocincta* (C.B. Adams, 1845)
- Pilsbryspira cinerea* (Weinkauff, 1876)
- Polystira florenceae* Bartsch, 1934
- Splendrillia moseri* (Dall, 1889)
- Tenaturris trilineata* (C.B. Adams, 1845)
- Truncadaphne chrysoleuca* (Melvill, 1923)
- Architectonicidae**
- Heliacis bisulcatus* (Orbigny, 1842)
- Pyramidellidae**
- Pyramidella dolbrata* (Linné, 1758)

PELECYPODA

Cardiidae

- Americardia media* (Linné, 1758)
- Laevicardium laevigatum* (Linné, 1758)
- Trachycardium magnum* (Linné, 1758)

Chamidae

- Chama macerophylla* (Gmelin, 1791)

Glycymerididae

- Glycymeris decussata* (Linné, 1758)
- Glycymeris undata* (Linné, 1758)

Limidae

- Lima lima* (Linné, 1758)

- Lima scabra* (Born, 1778)
- Lima scabra* form tenera (Sowerby, 1843)

Lucinidae

- Codakia orbicularis* (Linné, 1758)
- Lucina pensylvanica* (Linné, 1758)

Pectinidae

- Bractechlamys antillarum* (Recluz, 1853)
- Caribachlamys imbricata* (Gmelin, 1791)
- Caribachlamys ornata* (Lamarck, 1819)
- Caribachlamys sentis* (Reeve, 1853)
- Laevichlamys multisquamosus* (Dunker, 1864)
- Spathochlamys benedicti* (Verrill & Bush, 1897)

Pinnidae

- Pinna carnea* Gmelin, 1791

Pteriidae

- Pteria colymbus* (Röding, 1798)
- Isognomon radiata* (Anton, 1839)
- Pinctada imbricata* Röding, 1798

Spondylidae

- Spondylus americanus* Hermann, 1781
- Spondylus ictericus* Reeve, 1856

Tellinidae

- Tellina listeri* Röding, 1798
- Tellina magna* Spengler, 1798
- Tellina radiata* Linné, 1758

Veneridae

- Chione paphia* (Linné, 1767)
- Chione cancellata* (Linné, 1767)
- Pitar fulminata* (Menke, 1828)
- Ventricularia rigida* (Dillwyn, 1817)
- Ventricularia rugatina* (Heilprin, 1887)
- Verticordiidae**
- Verticordia ornata* (Orbigny, 1842)

WESTERN ATLANTIC TURRIDAE

by Kevan and Linda Sunderland



Clathrodrillia dautzenbergi (Tippett, 1995). 59 mm. 130', shrimp, Gulf of Venezuela.



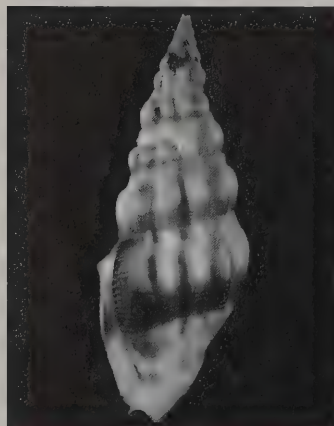
Clathrodrillia petuchi (Tippett, 1995). 45 mm. 450-500' off Sandy Lane Bay, Barbados. EX Finn Sander collection.



Eldridgea johnsoni Bartsch, 1934. 54 mm. 180-190 fms, Bahia Cocohinas, Cuba.



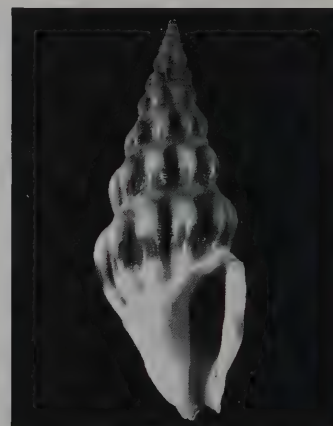
Famelica scipio (Dall, 1889). 28 mm. 500-600 m. Florida Straits north of Cuba.



Fenimorea janetae Bartsch, 1934. 34 mm. 80 feet, in sand around coral, Spanish Wells, Bahamas.



Fenimorea kathyae Tippett, 1995. 39 mm. 450-500' off Sandy Lane Bay, Barbados. EX Finn Sander Collection.



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Chesler, John. Unpublished manuscript.

Rosenberg, G. *Malacolog 2.01, an electronic database of Western Atlantic Gastropods*.

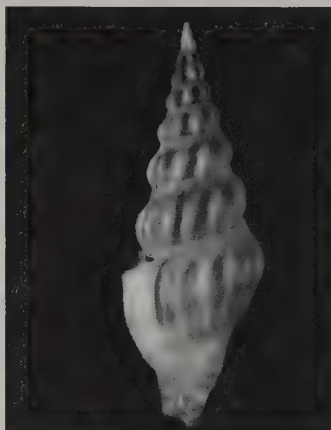
URL: [gopher://erato.acnatsci.org:70/wasp](http://erato.acnatsci.org:70/wasp)

Tippett, Donn L. 1995. "Taxonomic Notes on the Western Atlantic Turritidae" *The Nautilus* 109(4) 127-138.

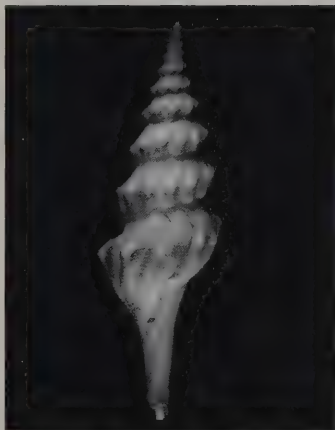
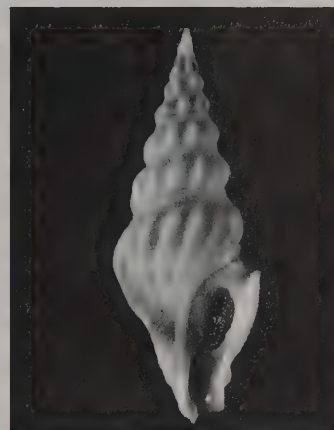
The intent of this feature is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



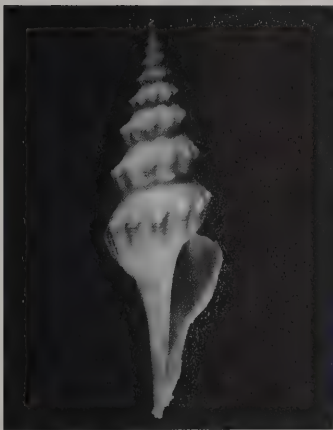
Fenimorea sunderlandi (Petuch, 1987). 52 mm. 200', dredged NW Gulf of Mexico.



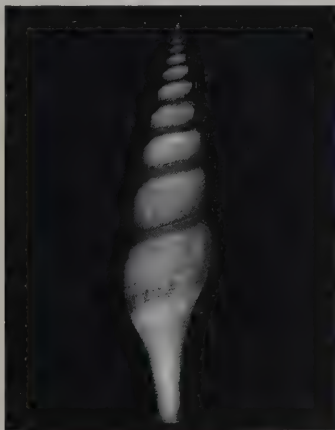
Fenimorea species. 45 mm. 400-450 m., dredged, Northern Bahamas.



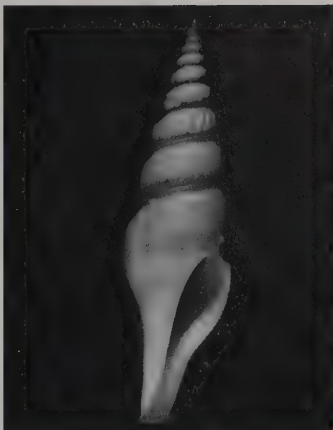
Fusiturricula fenimorei (Bartsch, 1934). 85 mm. 700', N coast of Puerto Rico.



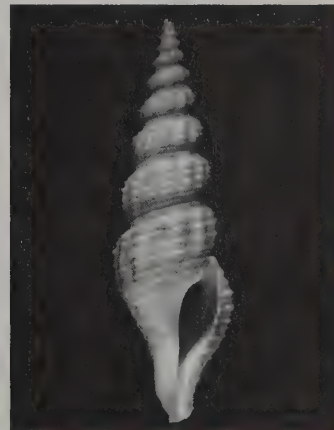
Fusiturricula janetae (Bartsch, 1934). 34 mm. 550 m., dredged, Eastern Honduras.

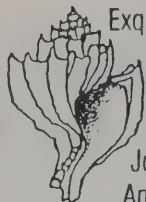


Fusiturricula species. 77 mm. 450-500 m., off Roatan Island, Honduras.



Fusiturricula species. 52 mm. 120 fathoms, off Tampa, Florida. EX Mike Cahill collection



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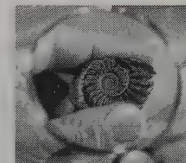
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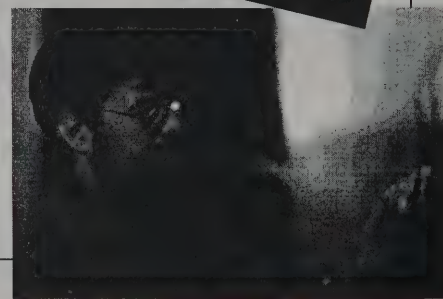
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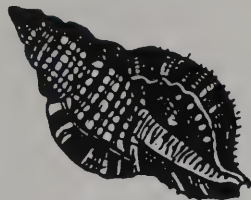
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CONCHATENTAIONS

by Gary Rosenberg

Mollusk Species in Practice

In my previous column I discussed the more theoretical aspects of species concepts in mollusks. In almost all cases, however, information is lacking on the genetics, reproductive behavior, or patterns of relationships among populations, so these theoretical concepts usually cannot be applied when defining molluscan species. In practice, morphological species concepts predominate, with species diagnosed on the basis of shape, sculpture, size, pattern, and color. If consistent differences can be found, the specimens in question go into two piles. If they can't, they go into one pile. But how do we get from piles to species? How much difference is enough?

Differences between species can be minuscule. Species of *Crepidula* have different larvae but identical shells. To the naked eye, the plump shells of the Jamaican land snails *Sagda grandis* and *Sagda monteogensis*, both Pilsbry & Brown, 1912, are almost identical. They have a slight, unconvincing difference in spire shape, but under magnification the former has microsculpture like woven fabric that the other lacks. These species can live side by side without intergrades, strong evidence that they are distinct. *Truncatella scalaris* (Michaud, 1830) and *Truncatella clathrus* Lowe, 1832 have been considered synonyms by some authors on the basis of shell morphology, but anatomical study shows clear-cut differences in the female reproductive system.

In the last ten years, studies of limpets, corals, and bryozoans have revealed cases where the smallest identifiable differences correlate to genetic differences. When scientists have sorted these animals by the subtlest differences in morphology, genetic studies have identified the same groups, which thus seem to represent separate, valid species. Does this mean that splitters are right? Should we name everything based on the least of differences? No—not any differences—consistent differences. Differences that work 100% of the time (or at least 99%). Differences likely to stand up when more specimens from new geographic areas, different depths, and different habitats are discovered.

Species are hypotheses. Sometimes the truth of the hypothesis is self-evident. When *Thatcheria mirabilis* Angas, 1877 was first discovered, the only proof one might have sought to establish its novelty was that it was not a fake or a monstrosity. But usually, when considering naming a new species, or attempting to distinguish known species, one should rule out at least nine explanations before concluding that species level differences are a viable hypothesis. These explanations fall into three broad categories: cases in which the differences are not genetic, cases in which they are genetic, but do not correspond to species differences, and cases in which the wrong comparison is being made. (Some examples might correspond to more than one explanation.)

Differences are non-genetic

Differences between species must be heritable: they must be characteristics that can be passed down from parent to offspring. If the differences between two supposed species can be explained by non-genetic means, then they are not different species. There are several such explanations.

1. *Ecophenotypic variation* — the technical term for differences caused by environmental conditions ("eco-" for environment; "pheno-" for appearance). For example, *Puperita pupa* (Linné, 1767) and *Puperita tristis* (d'Orbigny, 1842) are different forms of the same species that live in different salinities. Striped or spotted pattern is determined by the salinity, as shown by transplant experiments (see *American Conchologist*, December 1997, pp. 22-23). Appearance in mollusks can also be affected by diet, substrate, depth, crowding, growth rate, and presence of predators, parasites or pollution. I'll elaborate on some of these effects in my next column.

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2. *Misleading condition*. The condition of a specimen can be misleading in several ways. Many snails make a plug at the base of the protoconch to keep soft parts from being exposed if the protoconch is broken off. The plug itself can be mistaken for the protoconch when the latter is missing, leading one to believe them to be two species differing only in protoconch characteristics. I suspect this is the case with *Odostomia infrasulcata* Saurin, 1959 versus *Odostomia zaleuca* Melvill, 1911. Hermit crabs can modify the columella of shells, and differential erosion can produce unusual patterns of sculpture when it cuts into lower layers of the shell, or reveals different colors. It is also possible for mantle damage to produce a dramatic change in shell sculpture or shape. Shells fraudulently modified can also mislead: *Cochlostyla* species 1 and 2 on plate 48 of *Tropical Landshells of the World* are *Cochlostyla rufogaster* (Lesson, 1833) with periostracum removed and pattern added by application of shell-whitening heat.

3. *Non-random samples*. A huge amount of sorting goes on as specimen shells are sold and traded around the world. Once I purchased a lot of more than 100 specimens of the ovulid *Dentiovula takeoi* Cate & Azuma, 1973 from a dealer, thinking I had an excellent sample showing the range of variation of the species—fat, thin, large, small, light red, dark red. Several months later I learned another dealer had visited the supplier in the Philippines first, and had picked out the largest and all the purplish specimens. Collectors of Hawaiian *Achatinella* used to sort the specimens by color pattern, giving the impression that populations were more uniform than they really were, which perhaps accounts for the proliferation of names in the genus. Sorting can also occur naturally, if certain morphologies are more likely to be destroyed by predators or differentially transported by currents.

Differences are not species level

In many cases, differences between samples or populations presumably do have a genetic basis. I say "presumably" because in very few cases do we know the gene(s) responsible for the appearance of particular characteristics in mollusks. But even though the differences are genetic, they may be population-level or individual differences, not species-level differences.

4. *Clineal variation*. A cline is a gradual change in a species across adjacent populations. The populations at the endpoints of the geographic distribution are different, but the intervening populations have intermediate characteristics. *Argopecten irradians* (Lamarck, 1819) has a cline in rib number, as few as 15 in Massachusetts, as many as 25 in Florida. Sometimes the pattern is more of a crazy-quilt than a regular cline, but if enough specimens are studied, intergradation forestalls attempts to define consistent differences between populations.

5. *Individual variation*. A single mutation might result in pronounced morphological departure from what is typical for a species. Achondroplastic dwarfism and Down's syndrome in humans are two extreme examples. An example in mollusks might be the depressed-spine variant of some muricids, such as *Hexaplex cichoreum* (Gmelin, 1791), which was named *Murex depressospinosus* Dunker, 1869, although genetic evidence for this is lacking.

6. *Sexual dimorphism*. There are several cases of the males and females of the same species having been named as separate species. For example *Lambis rugosa* (Sowerby, 1842) is the male of *Lambis chiragra* (Linné, 1758). Male *Tricolia variabilis* (Pease, 1861) are not only smaller than females, but have a broader aperture and radular differences as well. *Phasianella megastoma* and *P. oligomphala*, described by Pilsbry (1895) from a single locality in Japan, are male and female of *Tricolia variabilis*.

Inappropriate comparisons

The cases above illustrate reasonable comparisons with incorrect conclusions. Species A and candidate species B are compared, and incorrectly found to represent different species. When inappropriate comparisons are made, Species A is ignored, and "Species B" is compared with Species X, or considered so unusual that no comparison is made.

7. *Bad locality data.* Errors in locality data can result in redescribing species from the wrong faunal province. *Engina slootsi* Jong & Coomans, 1988, described from a single specimen from Aruba is actually the Indo-Pacific *Morula biconica* (de Blainville, 1832). Of 83 species Tenison Woods (1877) named in a paper on Tasmanian shells, five were actually common Western Atlantic species: *Ethalia tasmanica* and *Adeorbis picta* (both of which he suspected had bad data) are *Modulus modiolus* and *Tegula fasciata*; *Monilea turbinata* is *Tegula ividomaculata*; *Semele warburtoni* is *Codakia orbicularis*; and *Pleurotoma weldiana* is *Fenimorea fucata* (to which he compared it). With specimens from two sources reported from four localities, this is not a single instance of mixed up labels or mis-remembered data. (Another way to get bad locality data is to drop a small shell on the floor and pick up in its place a specimen that previously dropped unnoticed.)

8. *Unexpected context.* Sometimes the locality data is correct, but the specimens are in an unexpected context. Shallow shells transported into deep water have been named as deep-sea species. Land and freshwater shells have been described as marine, perhaps having been washed down rivers into the sea. *Karolus primus* Folin, 1870, described from marine sand from Vera Cruz, Mexico, is the land snail *Ceciloides consobrinus* (d'Orbigny, 1841). *Potamopyrgus antipodarum* (Gray, 1834), a species native to New Zealand, was introduced to Europe where it was named *Hydrobia jenkinsi* E. A. Smith, 1889. A similar error occurs when a species first named as a fossil is renamed when it is discovered living.

9. *Erroneous classification.* Occasionally an author assigns a species to the wrong genus or family, often because of convergent morphology, and once having started down the wrong path, does not realize that the supposed new species has already been named in a different group. Recent examples are *Terebra moolenbeeki* Aubry, 1995, a *Mazatlanina* (Columbellidae); and *Clathurella eversoni* Tippet, 1995, named in Turridae, which is *Nassarina glypta* (Bush, 1885), another columbellid. A similar error occurs when an author is unaware that a species has already been named, which prevents proper comparison.

Mistaking a juvenile shell for an adult is another good way to be misled; sometimes resulting in erection of unnecessary new genera in

addition to new species. For example, Pilsbry (1894) named the new genus *Perostylus* for *Cerithium brazieri* Tryon, 1887 and *Perostylus fordianus* Pilsbry, 1894 but both are juveniles of *Syrinx aruanus* (Linné, 1758). *Litiopa effusa* C. B. Adams, 1850 and *Dissentoma prima* Pilsbry, 1945 are larval shells, probably of *Cymatium martini-anum* (d'Orbigny, 1845). Unexpected context added to the confusion with *Afrocanidea gemma* Connolly, 1929, described as a new genus and species from the Shimbi Hills of Kenya and compared to an estuarine genus from Asia, but actually the larval shell of the marine *Cymatium muricinum* Röding, 1798. There are even cases of fragments of shells having been mistaken for intact shells: *Capulus shreevei* Conrad, 1869 is the internal projection (apophysis) of the Angel Wing, *Cyrtopleura costata* (Linné, 1758).

How can one guard against these many pitfalls? In the first four cases, the general answer is to study specimens collected from a broad range of localities and habitats over a period of years. If there are intermediates, you will find them. In the fifth case, even if intermediates are lacking, it might be that no two individuals have the same morphology (e.g., rostrate cowries), so the mutants (or ecophenotypes?) can be recognized as such. In the sixth case, sexual dimorphism, there may also be intermediate specimens, and anatomical studies will rapidly settle the question (or one can avoid the question by studying pulmonates). In cases of inappropriate comparison, the best safeguard is broad expertise in molluscan systematics. The specialist who focuses on a particular family, fauna, or habitat is more likely to be misled. Another safeguard is the peer review process, both formal and informal. In all cases, avoid describing a species from a single specimen.

Don't just look at specimens. Magnify them, draw them, photograph them, observe them in the wild. Try your hand at dissection. Write a comparison to related species—it will force you to hone your observations. Keep a checklist of characters and record absence as well as presence. Rely on pattern more than color, sculpture and shape more than size. Virginia Maes once told me when I was trying to learn how to distinguish two species, "Measure them, count them, play tiddly-winks with them, and if there are differences you will find them." Learn the language of variation and let it be your guide.

COA Educational Grants for 1999

by Gary Rosenberg

The Educational Grants Committee for 1999 consisted of Dr. Henry Chaney, Dr. G. Thomas Watters and myself. This year 29 grant proposals were received, requesting a total of \$33,069 in support. By comparison, last year 28 proposals totaling \$41,243 were received. The decline in funds requested was a result of modified instructions for preparing budgets: those applicants applying to multiple funding sources were asked to present an overall budget and then specify which items they wished COA to fund. Of the 29 applicants, 24 were graduate students and 5 were professional biologists. Eight proposals were international, with three from Canada, two each from Brazil and Mexico and one from Germany.

A total of \$6500 was awarded to eight proposals, all by Ph.D. candidates. This year's winner of the Walter Sage Award is Rebecca Price, with a study of the evolution and function of columellar folds. The winning proposals for 1999 are summarized below; information on past awards and the grant program can be found on the Internet at <http://coa.acnatsci.org/conchnet/coagrant.html>. The next deadline for grant applications has moved to February 1, 2000.

Gregory S. Herbert, University of California, Davis, \$400

"Patterns of extinction selectivity, species replacement, adaptation, and recovery in the Muricidae (Mollusca: Gastropoda) of the Late Neogene of Florida."

Matthew C. Kay, University of Oregon, \$400

"Reproduction and post-larval dynamics of the flat abalone *Haliotis walallensis*, and implications for the role of boulder fields in the early life history of abalones."

Dwayne Minton, University of Hawaii, \$1,000

"Effect of microhabitats on the diversity and distribution of Caribbean littorines."

Cintia Miyaji, Universidade de Sao Paulo, \$1,000

"Prosobranch gastropods from shelf-break and upper continental slope off Brazilian southeastern coast."

Rebecca M. Price, University of Chicago, \$1,000

"Evolutionary and functional analysis of columellar folds in the Fascioliariidae."

Elizabeth K. Shea, Bryn Mawr College, \$1,000

"The structure and development of the proboscis in ommastrephid squids (Cephalopoda: Ommastrephidae)."

Jeffrey T. Watanabe, Florida Institute of Technology, \$700

"Non-drilling oyster drills: the growth and reproduction of *Stramonita haemostoma* on Florida sabellariid worm reefs."

Anthony B. Wilson, Universität Konstanz, Germany, \$1,000

"Evolution of Lake Tanganyika Gastropoda: A predator/prey model of coevolution?"

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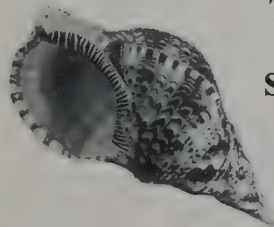


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Shell Auctions on the Internet

By Tom Eichhorst

If you are a member of Conch-L, have a computer and surf the web, or even if you don't have a computer but watch the evening news—you have heard about Internet auctions. The ones usually discussed on the evening news are the big ones—Ebay.com or Amazon.com (yes, they also have an auction). There are many such services and in the last year or so there have been an increasing number of seashells showing up on these auction sites. So, is this the newest trend? Can you find great bargains on specimen shells? Is there a chance of getting ripped off? The answer is a qualified yes to each of these questions. There are good deals to be had but like any endeavor where money is involved there is also a chance for fraud. This article will introduce you to Internet auctions and hopefully provide a few tips for buying shells from these sites.

First, there are basically two types of Internet auction sites: 1) the huge sites like Ebay that sell almost anything, and 2) the smaller, shell-specific sites like Bret Raines' molluscs.net where specimen seashells are the mainstay. A world of difference separates the two types of sites and as a buyer or seller, your approach must be gauged according to the site you are using and what you are looking for. Selling? Oh yes, you can use these sites to sell your shells as well as purchase new ones. What most of these sites have in common is that they merely act as brokers or middlemen between two private parties—seller and buyer. The actual deal is between you and someone you have never met.

The Shell Specific Sites

The two most established, seashell-specific sites with auctions are Bret Raines' molluscs.net and *Hawaiian Shell News*. These sites are run by individuals who have a knowledge of shells and shell collecting. Thus the shells offered are typically specimen quality, suitable for collecting, and most often accompanied by a decent data slip. At both sites you can see an image of the actual shell you are bidding on and there is a short description. Both sites are also very responsive in getting your shells to you.

Of the two, the molluscs.net site is the largest and has some very useful features not found on the smaller *Hawaiian Shell News* site. To enter a bid on molluscs.net you must first register and get an identity number. Save this, as you will need it every time you bid. The auctions happen every other month or so and contain about 50 items. Each item (usually a shell but sometimes shell-related items are offered like stamps or shell books) has a minimum price. Bidding is as simple as entering your bid price and identification number. A feature on this site (as well as Ebay) is a "max bid." Here you can enter the maximum amount you are willing to pay and the amount you are presently bidding (hopefully much lower). As the auction progresses and other bids are received, your bid will automatically go up in minimum increments to cover each new bid until your maximum amount is reached. Once this happens your bidding ceases and you are dropped from the race. This way you do not have to stay at the computer watching the bidding as the closing time approaches—although many people do just this and try putting in winning bids at the last minute. There is even a program for sale on the Internet that will do this for you automatically. If you have the high bid you will be notified of the amount owed by e-mail and it's now just a matter of paying and waiting for the mail.

The *Hawaiian Shell News* site is much smaller in scope and lacks some of the features of the larger sites. There are usually only 15 or so shells offered, but there are still nice shells to be had here. On this site you bid via e-mail, with no provision for a maximum bid. The bids are not automatically updated so you do not really know if the last posted bid has been outbid or not. This means you may see a bid of \$4 but the

actual bid on the item might have gone up to \$10 since the last update. Obviously, this makes bidding a bit chancy. Again, if you have the winning bid you will be notified via e-mail and shipping is very prompt.

Some shell dealers (George Sangiouloulou for one) have started offering auctions of some of their shells on the Internet. These auctions work pretty much like the ones just described. Remember, at all of the shell specific sites you are dealing with established shell dealers or people at least knowledgeable about seashells. This is not the case when you deal with the large auction sites.

The Major Auction Sites

Major auction sites like Ebay and Amazon work much like the smaller sites with a few differences. None of these sites has a seashell category as yet. You have to do a search and if you really want to see what is offered you will have to do several searches. The sites have built-in search functions; you just type in the keyword, hit "search" on the screen or "enter" on your keyboard and you will get a screen of all items that include that keyword. You often have to search for "seashell," "seashells," "sea shell," and "sea shells" in order to find all of the items offered. Of course you will also get various items with a seashell motif, but that is half of the fun. In the last six months there have been countless offerings of a statue of Venus stepping out of a scallop shell (with prices from \$15 to \$40 for the identical item). When you find the item you are interested in you can place your bid (again, you must first register). A feature on Ebay is "feedback" which allows you to see what others have said about the seller (or buyer), how many transactions they have completed, and how long they have been operating on Ebay. As you can imagine, there are many ways around this, but it will still give you some idea about the person you are dealing with. There is also a provision to e-mail the individual and ask questions about the item being offered. Amazon and the other auction sites work pretty much like this. Sounds good so far, so what are the drawbacks?

The main drawback to the larger sites is the amount of junk you have to wade through to find a shell you might want. There are lots of people using these sites and the majority of shells offered are worn beach shells Aunt Sadie picked up in Florida a few years ago. There are specimen shells offered occasionally—but not often, at least not yet. So why bother? Because you can get some pretty good deals from time to time. At least one dealer has offered specimen shells on Ebay and a couple of people have sold off their collections. However, be forewarned: most of the shells offered are in sorry shape. A second drawback is that you are often dealing with someone who knows nothing about the item he is selling. A listing for "shells in perfect shape and condition from Florida" can easily end up as an assortment of Philippine shells, beach shells from Florida, pieces of coral and rocks. Thankfully, a picture of the item accompanies most listings.

Tips on Getting That Shell

So you have decided to try your hand at the online auction. Here are a few tips, lessons learned, what have you, that I've picked up over the last couple of years.

1. Try the small shell-specific sites first. Here, your chances of getting a nice shell for a fair price are very high. You are dealing with established individuals who know shells and rate them as to gem, fine, etc.

2. Proceed slowly and with caution. When you are dealing with a shell dealer in a store or by mail order you are dealing with someone who, by and large, wants to establish a good relationship, and so encourage repeat business. Online, this is not necessarily true. Here you are dealing with an individual who, in many cases, will never sell to you again. So keep the order small and do not trust the picture. I have had shells switched (after all a spiny shell is a spiny shell, right?),

THE OLD SHELL GAME... FLUORESCENCE IN MOLLUSC SHELLS

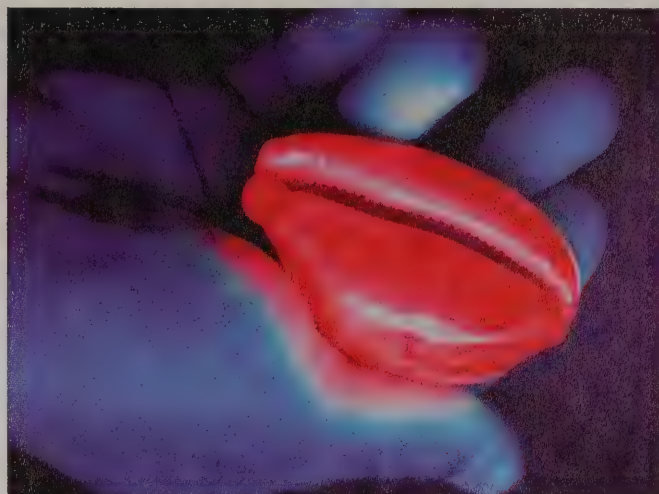
by Paul R. Monfils

I paused, allowing my eyes to adjust to the muted purplish glow emanating from every object in my field of view. Identifying an open doorway, I stepped tentatively forward. Scattered points of hazy blue-white light glowed eerily in the darkened space beyond. Holding my lamp at arm's length before me, I advanced into the gloom. As I entered, a cloud of rosy luminescence erupted to my right, not ten feet away. I approached with deliberate steps, never shifting my gaze from the apparition, the intensity of which increased rapidly as I drew near. Extending my free hand, I located a firm projecting lip, just under the lower margin of the resplendence. I grasped it firmly, drew it toward me. The tray slid smoothly out, revealing dozens of polished globular forms, each blazing like a pink-orange neon bulb! Stimulated by the rays of my ultraviolet lamp, they responded with an astonishing display of brilliance and color. They were map cowries (*Cypraea mappa*), but I had never seen them like this!

I stood transfixed, not quite sure I should believe my eyes! I picked one up in my hand, rotated it slowly. The base of the shell radiated even more brightly than the dorsum! After marveling over this sight for a couple of minutes, I was suddenly seized by a determination to scan every tray in the place. I started sliding out one after another, scanning the lamp over each exposed lot of shells. In tray after tray, the paper labels emitted their characteristic blue-white brilliance, but the shells just reflected the muted glow of the lamp.

Then, about fifteen trays later, one plastic box in a rear corner lit up like it was full of Christmas tree bulbs. In the dark, I couldn't tell what the shells were, so I switched on the room lights. The box contained a dozen Atlantic gray cowries (*Cypraea cinerea*). Lights off! Back to the hunt! In the very next tray I struck pay dirt again—*Cypraea pulchra* glowed bright red-orange. Twenty other *Cypraea* species in the same drawer showed no trace of fluorescence. When a tray of Triviidae was exposed, little dots of red, pink and orange sparkled all over the place. Nearly every *Trivia* and *Erato* specimen gave off a fluorescent glow, some incredibly intense, others less so. I continued my methodical scanning of cabinet trays. *Angaria vicdani* and *Angaria sphaerula* blazed vivid crimson! The spots on *Acteon eloiseae*—WOW! The intricate pattern on *Marginella denticulata*—ZOW! The red African *Clanculus puniceus*, the pinkish Philippine *C. margaritarius*, and the brown Australian *C. undatus* all glowed identical blood red. On twenty specimens of *Tegula regina*, every protoconch radiated brilliant pink, while the rest of the shell remained dark. Some species of Limidae emitted an eerie yellow-green glow, reminiscent of the chemical light sticks used on camping trips. Three hours and 5,500 species later, I had accumulated a list of about 30 species which showed pronounced fluorescent emission under ultraviolet (UV) radiation, and a smaller number which exhibited some lower level fluorescence.

Fluorescence is defined as "emission of electromagnetic radiation by a substance, when stimulated by absorption of incident radiation." Electromagnetic radiation (EMR) refers to energy forms which can move through space as a wave. Common forms, which differ from one another in their respective wavelengths, include x-rays, UV, visible light, infra-red, microwaves, and radio waves. A fluorescent substance then, when exposed to a particular form of EMR, responds by giving off a different form of EMR. Because some energy is lost as radiated heat during this process, the emitted fluorescent waves have a lower



Cypraea mappa, hand-held (F), under UV illumination

energy level (= a longer wave length) than the absorbed incident waves. In the examples mentioned above, the incident EMR was UV, while the emitted EMR consisted of various wavelengths of visible light, which we perceive as different colors.

One aspect of this phenomenon which I didn't realize at first, is that some species which appear white in daylight also fluoresce white! Most white shells appear dull violet under UV, but a few, like certain species of Limidae and Ovulidae, appear bright white. Since this could not be due to reflected light (there is no white light to reflect), it must be due to broad-spectrum fluorescent emission. When I placed a *Conus amadis* and a *Conus aulicus* side by side, the white tents of *C. amadis* appeared brilliant white, while those of *C. aulicus* were muted purple.

Fluorescent properties show a strong tendency to run in families. Since fluorescence is a function of pigments or other compounds incorporated into the shell matrix, rather than the matrix itself, one might expect that the families most noted for brilliant pigmentation might exhibit the highest levels of fluorescence. Not so! No fluorescent species were noted in Pectinidae, Muricidae, Olividae, or Conidae (except as noted above under white fluorescence). Only in Triviidae and Bullidae were a majority of the species positive; but several positive species were identified in Turbinidae, Trochidae, Stomatellidae, Marginellidae, Fissurellidae, Phasianellidae, Veneridae, and Isognomonidae. No fluorescent shells were identified in any of the other common families, most of which were well represented among the scanned specimens.

UV lamps are available as fluorescent tubes or incandescent (screw-base) bulbs. The latter are much cheaper, but emit far too much visible light to be useful in this kind of work. My unit consists of a pair of 18-inch, 15 watt UV tubes, housed in a stainless steel reflector, and works very well. Such "black light" tubes can be purchased at most large lighting stores or electrical supply houses. The rays emitted by such lamps are long wave UV—NOT the short wave UV which causes sunburn, damages your eyes, and destroys pigments in drapes and shells! Photography of fluorescent emission is quite simple, provided you have a camera that can take time exposures, and a tripod, copy stand, or other device to hold the camera steady. An exposure of 30 seconds to 2 minutes is usually required to produce a good image. Use ordinary daylight film, preferably one of fairly fast speed, and try a few different exposure times. A UV source which is too weak will not produce the maximum fluorescent emission in a fluorescent object. However, there IS a maximum fluorescence level for any given object, and using an unnecessarily powerful UV source will not make the object fluoresce beyond its maximum; but it will add unwanted visible light to the scene, because long wave UV lamps emit a small amount

of violet light along with the UV. This feature is useful because fluorescence work is done in the dark, and the dim violet emission gives you just enough light to find your way around. It is advisable to wear dark clothing while doing fluorescence photography. Most white clothing fluoresces brilliantly, and can throw unwanted white light onto the photographic subject.

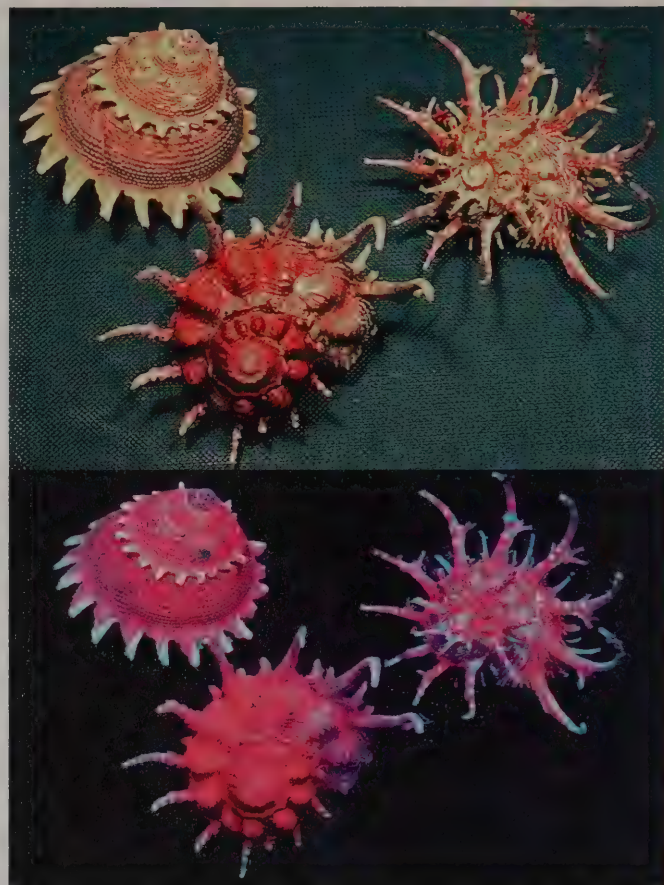
After observing such a phenomenon, one might be tempted to formulate elegant theories concerning possible benefits of fluorescent pigments to the organisms which possess them. Alas, most such creatures never have the opportunity to realize their fluorescent potential, as their deep water environments are never touched by UV rays—just as the brilliant colors and intricate patterns of their shells would likewise seem to be eternally unappreciated in a world of darkness. Perhaps this is why shell collectors were placed upon the earth.

FLUORESCENCE IN MOLLUSCS

The photos below are paired, those with white light above their ultra-violet-lighted twins. F = fluorescent NF = non-fluorescent
All photos are by the author.



Clockwise from upper left: *Tegula regina* (F - apex only); *Cypraea venusta sorrentensis* (F); *Bulla ampulla* (F); *Megathura crenulata* (F); *Venus affinis* (F)



Clockwise from upper left: *Bolma erectospinosa* (F); *Angaria vic-dani* (F); *Angaria sphaerula* (F) Note the small calcified encrustations, which fluoresce blue.



Left: *Cypraea stercoraria* (NF); Right: *Cypraea mappa* (F)



Clockwise from upper left: *Pseudostomatella papyracea* (F); *Marginella ponderosa* (NF); *Marginella senegalensis* - 2 specimens (F); *Chlamys rastellum* (NF); *Phasianella ventricosa* (F); *Marginella ventricosa* (NF)



Clockwise from upper left: *Acteon eloiseae* (F - spots); *Marginella denticulata* (F); *Fissurella dubia* (F); *Clanculus puniceus* (F); *Clanculus margaritarius* (F); *Trivia merces* (F); *Trivia nix* (F); *Clausinella fasciata*—2 specimens (one F, one NF)



Clockwise from upper left: *Cypraea pulchra* (F); *Cypraea schilderorum* (NF); *Cypraea subviridis dorsalis* (F); *Cypraea lurida* (NF); *Cypraea pulchra* (F); *Cypraea sulcidentata* (NF); *Cypraea cinerea* (F).



Left: *Acesta rathbuni* (F); Right: *Laevicardium elatum* (NF)
Yellowish to greenish fluorescence was seen in several species of Limidae.

(Continued on page 28)

OUR BRAZILIAN CONNECTION...

by José Coltro, Jr.

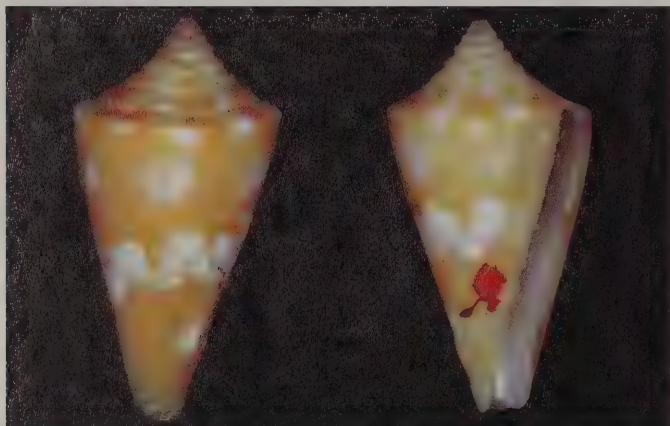
Dr. Petuch, You Were Right Again!



Conus worki Petuch, 1998.

Ever since I started collecting shells seriously I have heard many comments about the species described by Dr. E. J. Petuch. Most of those commenting have disagreed with his descriptions. But as time passed, I found again and again that Dr. Petuch's works are some of the best done on the Brazilian fauna in this century.

Dr. Petuch visited our country in 1977 and he found an amazing number of new species, including some fantastic ones like *Plicoliva zelindae*, *Vexillum kaicherae*, *Vexillum lixa*, and *Cyphoma macumba*. He conducted his main research in the Abrolhos Archipelago and, as he predicted in his book, *New Caribbean Molluscan Faunas* (1987), this area is still turning up many new species, species like *Conus bertarollae* described by Dr. P. M. Santos Costa and Dr. L. R. Simone in 1997. Dr. Paulino Souza is even now describing a new *Bullata* from there, too. Long after his 1977 trip, Dr. Petuch continues to describe new mollusks from our area, species like the beautiful *Conus riosi*, *Conus carioca* and *Polystira coltrorum*.



Conus sanderi Wils & Moolenbeck, 197. Paratype (Brussels Museum)

Last May I went to the Brussels Museum where I could see the types of many shells; one of them attracted my attention: *Conus sanderi* Wils & Moolenbeck, 1979. Prof. E. C. Rios in his book placed this species in our waters and considered *Conus carioca* Petuch, 1986 a synonym. Well, it turns out Prof. Rios was wrong and Dr. Petuch was right. Comparing both species, one can see they are easily separable. *Conus sanderi* is a species endemic to the deep water West Indies, while *Conus carioca* is endemic to the central south Brazilian coast; something like 6,000 km lie between the two species!

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Recently Dr. Petuch named a new *Conus* to the Bahia region, *Conus worki* Petuch 1998. Finally this species, considered by many as the "Brazilian *Conus daucus*" Hwass, 1792, has a valid name. For many years I tried to convince biologists to study this shell and many of them refused because they didn't want to work with this messy group. Dr. Petuch had the courage to do just that and he was right again. And so our orange *Conus* from Bahia is a species separate from *Conus daucus*!

Today, Dr. Petuch's papers and ideas are helping a new generation of Brazilian malacologists who believe as he does that our fauna deserves better study. And most of them are very thankful for Dr. Petuch's help.



Conus carioca Petuch, 1986.

(Continued from page 27)



White fluorescence: Top row, left to right: *Balcis martini* (F); *Tellina liliana* (NF); *Ovula costellata* (F); *Trivia millardi* (NF)
Center row, left to right: *Epitonium scalare* (NF); *Oliva lignaria albescens* (NF); *Lima lima vulgaris* (F); *Calpurnus verrucosus* - 3 specimens (F) Bottom row, left to right: *Cyrtopleura costata* (NF); *Latiaxis vicdani* (NF)

RECAPITULATING ONTOGENY TO DETERMINE ANCESTRAL FORMS

by J.R. Stone, 1996 COA Grant Recipient

Members of the marine gastropod family Strombidae are characterized by labial elaborations: "circumapertural projections" (CAPS) of species of the genus *Lambis*; elongated, delicate apertural lips of *Terebellum terebellum*; and robust, flared apertural lips of species of the genus *Strombus*.

The most recent formal classifications of these three genera were performed by R. Tucker Abbott (1960, 1961; Jung and Abbott 1967), almost 4 decades ago. These classifications were conducted on the basis of information concerning (predominantly) shell and (to a lesser extent) verge (*i.e.*, penial) morphology, and taxa were grouped according to morphological similarity.

Since Abbott's work, evolutionary biologists have endorsed the use of cladistic methodology (Hennig, 1966) for the classification of organisms. In a cladistic analysis, traits of taxa are examined and coded into (numerical) character states (*e.g.*, the presence of CAPS may be coded as the number 1; in this case, the number 0 may be considered to represent the absence of CAPS). The taxa examined consist of an "ingroup" and an "outgroup." The ingroup comprise taxa for which classification is sought (*e.g.*, a putative genus, such as the 9 species currently classified in *Lambis*); whereas the outgroup (which should consist of at least two taxa — *e.g.*, *Terebellum terebellum* and species of *Strombus*) serves as a reference for coding character states of the ingroup. Character states shared among members of the ingroup and the outgroup are "plesiomorphies" (*e.g.*, the presence of a Stromboid notch is shared among species of *Lambis*, *Terebellum terebellum*, and species of *Strombus*, so this may be coded as the number 1 for all these taxa); whereas character states shared among only members of the ingroup are "apomorphies" (*e.g.*, with respect to the lengths of tentacles, the lengths of ommatophores of species of *Lambis* are relatively short in comparison to those of *Terebellum terebellum* and relatively long in comparison to those of species of *Strombus*, so this may be coded as the number 1 for species of *Lambis*, 0 for *Terebellum terebellum*, and 2 for species of *Strombus*). Ideally, the outgroup consists of taxa that would be classified in immediate proximity to the ingroup. Use of such "sister taxa" ensures that apomorphies are very specific.

"Clades," or hierarchical groupings of taxa, are determined on the basis of "synapomorphies," or shared apomorphies (*e.g.*, sets of 1-codings), and a "cladogram" is a symbolic representation of the most consistent hierarchical arrangement of synapomorphies (*i.e.*, union of minimally intersecting sets). If "characters" are considered to be hypotheses of taxonomic kinship and character states represent their physical manifestations (traits), then cladograms represent the most consistent arrangement of evidence concerning potentially mutually excluding hypotheses of taxonomic kinship (more complete, formal

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Oops...

Apologies go to Patty Jansen for some incomplete editing of her article, "Have You Got What It Takes...To Be An Author?" in the June issue.

descriptions of cladistic methodology are contained in Wiley 1981, Wiley *et al.* 1991, and Brooks and McLennan 1991).

Cladograms are branching diagrams. The patterns depicted by cladograms are used to classify organisms and can be interpreted as reconstructions of the evolution of the ingroup contained therein. Only clades may be given supraspecific designation, as such groups may be interpreted to have originated from a unique common ancestor.

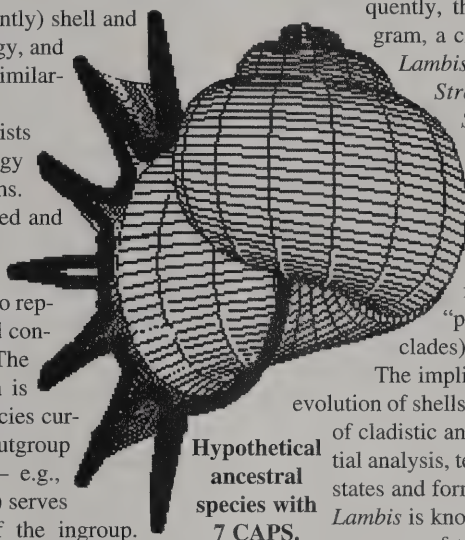
A recent cladistic analysis performed on 26 species of stromboid gastropods (using species of *Lambis* as the ingroup, *Terebellum terebellum* and species of *Strombus* as outgroups, and character states concerning soft body anatomy and shell and radular morphology; Stone 1997) yielded a cladogram that is inconsistent with traditional classifications of the genera *Lambis*, *Terebellum*, and *Strombus* and, consequently, the family Strombidae. In particular, on the cladogram, a clade containing all 9 species currently classified as *Lambis* also contains three species currently classified as *Strombus*; other species currently classified as *Strombus* surround *Terebellum terebellum*. Therefore, according to the analysis, the genus *Lambis* is "paraphyletic" (*i.e.*, taxa currently classified outside the genus occur within a clade containing all species currently classified within the genus), the monotypic genus *Terebellum* is an invalid taxon designation, and the genus *Strombus* is "polyphyletic" (*i.e.*, member species occur in disjunct clades); thus, the family Strombidae is untenable!

The implications of these findings concerning morphological evolution of shells of *Lambis* can be considered. Combining the results of cladistic analysis with mathematical modeling and morphospacial analysis, techniques with which forms are quantified, ancestral states and forms can be reconstructed. For example, no species of *Lambis* is known to have 7 CAPS, but, according to the historical sequence of taxa that evolved (as inferred from the cladogram), the number of CAPS has decreased from 11 to as low as 1. A glimpse of a hypothetical ancestral species with 7 CAPS can be simulated, using a computer-graphical model of shells (Stone 1995; see Figure). Perhaps such forms have been realized and await uncovering as fossils.

This work was supported by a Conchologists of America Research Grant to the author.

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Hypothetical
ancestral
species with
7 CAPS.

In Memoriam

Mel Amsel

Wynant Dean
Norris McElya

Alfredo Romeu
Virginia Upton

BOOK REVIEWS

Two reviewers, Patty Jansen and Richard Petit,
look at the first volume of a new European series:

A Conchological Iconography Vol. 1. Family Harpidae by S. Peter Dance, Guido T. Poppe and Thierry Brulet. ConchBooks, Hackenheim, Germany. 69 p., 210 x 295 mm, 51 color plates, b/w line drawings, loose-leaf issue with four holes punched for later binding (binders to be available with Vol. 2) ISBN 3 925919 28 7.

This beautiful collector's edition was published as the first of a series, an Iconography, with the great conchological iconographies of the past in mind, works like Reeve's and Pilsbry's. The difference is, as author Guido Poppe says on his web site, that this modern iconography will not ever claim to be exhaustive. That is simply not possible, given the sheer volume of molluscan species known today. Instead, the series will concentrate on the more popular collectible families, a goal that is quite admirable in itself.

This first volume has 51 colour plates, printed on thick paper, each sheet of paper printed on one side only. The quality of the colour plates, all of which were produced digitally, varies from excellent to adequate, and indeed all species are depicted so as to facilitate identification, with several specimens photographed from more than one side. The comparative plates in the back, which illustrate a number of species side by side, are very useful.

The text on the first 17 pages describes the taxonomical history of the family Harpidae, gives limited information on biology, ecology and shell morphology, and has a complete list of Harpidae species and their main synonyms and a list of references on the family. This reference list will prove very useful for those who intend to study the family in more detail.

There is also a description of a new species, *Morum fatimae* n. sp. While I am not sure if this is the right place to describe new species, at least the holotype has been placed in a publicly available collection, if only the text mentioned which institution KBIN stands for!

There is a small point of confusion. Whereas the cover says the authors are Guido Poppe and Klaus Groh, the pages inside have "Guido T. Poppe & Thierry Brulet - 1999" as footnote, and the inside cover page has Guido Poppe, Thierry Brulet and Peter Dance as authors. So who are the authors?

The compilers have chosen for a loose-leaf format, allowing collectors to purchase only the volumes dealing with families in which they are interested. Whilst I am personally not in favour of loose-leaf publications — I find them messy and easily damaged — there are some distinct advantages, first of all in the price: a publication of this calibre would have required a hard cover, and these are expensive. Instead the publisher will be offering a binder with the second volume. You may choose not to use the binder, since the publication is in universally accepted A4 format, with four punched holes and you should have no trouble buying a cheap binder, even if only to temporarily house the first volume. Unless, of course, you live in the US where archaic paper sizes are still the norm, rather than the exception.

In all, I am convinced collectors will love the abundance of colour in this publication, which allows them to identify Harpidae in their own collections, as well as drool over the ones only a select few will be able to afford. I am sure we are all looking forward to the second volume.

—Patty Jansen, Capricornica Publications, 27 Winchester Ave.,
NSW Australia Email: capric@capricornica.com

The many non-professionals who attempt to study mollusks and publish their findings in a manner acceptable to the scientific community have been dealt a setback by another slick-paper, good-looking, poorly researched work published by non-professionals under the guise of definitive taxonomic work.

First a physical description of the publication is needed. It is A-4 in size, loose-leaf and punched for a 4-hole binder that is not normally available in the U.S., although it is stated that a "proper binder" is available from the publisher. There are 17 pages of introductory material and text followed by 51 full-page color plates and a final index page for a total of 69 pages. The text and plates are attributed to various combinations of authorship that will make citation very difficult. Authors' names appear on the bottom of each page. The title page is not attributed except that it bears the statement, "directed by Guido T. Poppe & Klaus Groh." Page 2 is attributed to these same two authors (in reverse order) although under the the ISBN number the manner of citation given is "The family Harpidae / Guido T. Poppe; Thierry Brulet; S. Peter Dance." Pages 3-11 (table of contents and text of "Family Harpidae") are attributed to S. Peter Dance and Guido T. Poppe as are pages 14-17 (acknowledgements and bibliography) and page 69 (index). Pages 12-13 are "A new species of *Morum*" by Guido T. Poppe and Thierry Brulet. All of the plates are attributed to these latter two authors.

This work is the first in a planned series of such "iconographies." The introduction discusses the proliferation of information on mollusks and states that this work is to be "a publication analysing, synthesising and simplifying it all." Unfortunately there is little "analysing or synthesising" to be found as the text consists only of a few pages of "notes on some of the species" with few descriptive or comparative remarks. The user must rely almost entirely on the photographs for identification purposes. Fortunately, the plates are very good. The introduction states that "distribution details" will be found on the bottom of each page, but the only localities given appear to be those of the specimens photographed, with no mention of distribution. No statement is made as to whether or not all known Recent species of the family are included.

Those who can match their specimens against figures still have the problem of not having a correct name. This reviewer is not a specialist on Harpidae but the following errors were too obvious to ignore: *Harpa cabriti* Fischer, 1860 is misattributed to "Lamarck, 1816." *Harpa kajiyamai* "Rehder, 1973" and *H. kawamurai* "Habe, 1973" have both been demonstrated to be attributable to Habe, 1972 (Petit & Bieler, 1996, *Malacologia* 38:43-44).

Some reason for attributing the family name Harpidae to Chenu, 1859 would have been in order, as would an explanation for the unconventional and distracting usage of bold face type for family and superfamily names.

A new species of *Morum* is described by Poppe & Brulet on pages 12-13. Citation of this new species of *Morum* is complicated by the manner in which the various pages are attributed. It appears that a complete citation would be *Morum fatimae* Poppe & Brulet in Dance & Poppe in Poppe, Brulet & Dance. It is obvious that for citation purposes *A Conchological Iconography* will need to be, and should be, treated as a serial publication. If future parts are numbered, leaving "[Part 1]" for the Harpidae, it will greatly facilitate citation of the work.

Throughout the work there are tantalizing references to taxa and figures for which there are no references cited. One such is a reference to "Cubières, 1803," evidently cited only to show a figure printed in reverse. As it does not appear in the references there is no way to determine what this 1803 work really is. His work, which is gratuitously stated to have been "written for and dedicated to women" was first published in *An VI* (= September 22, 1797-1798) and a later edition appeared two years later in *An VIII*. This reviewer has been unable to

find any later work by this author, especially one dedicated *aux femmes*, but his figure of 1797-98 and 1799-1800 (plate 9, fig. 1) matches that reproduced.

The two pages of "selected bibliographic references" consist mainly of references to secondary literature with most works in which the taxa were described being omitted. The references exhibit signs of carelessness as well as incompleteness. A short paper by Scott Johnson is listed under both "Johnson, S." and "Scott, J." and the volume and number of the issue of *Hawaiian Shell News* in which it appears [41(6)] is not given.

The quality of the photographs and the paper on which they are printed is sufficient justification for the price of \$ 45.00. With additional text, comparative remarks, distribution records and a more complete list of references it could have been a much more useful reference instead of being just another "picture book." Hopefully, future issues will live up to the promise of "analysing, synthesising and simplifying" made in the introduction.

—Richard E. Petit, 806 St. Charles Road,
North Myrtle Beach, SC 29582

Catalogue and bibliography of the marine shell-bearing Mollusca of Japan. Shun'ichi Higo, Paul Callomon and Yoshihiro Goto. 1999. Elle Scientific Publications, Osaka, Japan. 749 pp. A4 size, bound. \$ 130.00

This is the text volume of a projected two-volume set, the second volume of which will be the plates. Even without the plates this is an important reference for the collector interested in the mollusks of Japan and vicinity.

The short Introduction in this work contains a surprising amount of information about the Japanese molluscan fauna and its literature as well as much other pertinent information. It is recommended reading.

The *Catalogue* lists only those species that have been reported from Japan and adjacent waters. Locations are tied to easy-to-use distribution maps. Most books on Japanese shells treat basically the same species but this work lists all species described or reported from Japan. For each species the Latin name is given in its current placement as well as its generic placement. The original citation, including authorship and date, is given not only for each species but also for all group names and is listed in the extensive bibliography. Manuscript names, which appear in many Japanese shell books, are not included.

The bibliography is the most extensive ever published on the Japanese molluscan fauna and many Japanese works are cited with their titles translated into English for the first time. This bibliography is a valuable tool in its own right and will be much used. Also, information is included on all Japanese serial publications.

The book is entirely in English. The standard Japanese vernacular names for all species are given but instead of being rendered in *kana* as usual they have been transcribed into the Roman alphabet with the addition of hyphens showing where there are breaks in the parts of the name. There is no hyphenation in Japanese, but these hyphens have been inserted to separate the components of the name and assist in pronunciation. For the first time ever there is a complete list of Japanese vernacular names in the Roman alphabet.

As with any work of this scope (6,683 nominal species-level taxa listed) there are some minor errors but they do not detract from its usefulness. The book itself is a fine production in A4 size, bound in Damascene cloth with a gold imprinted leatherette spine. It is this reviewer's suggestion that you obtain this work now and not wait for the appearance of the companion plate volume. It is too valuable a tool to ignore.

—Richard E. Petit, 806 St. Charles Road,
North Myrtle Beach, SC 29582

New Winner Book

Beatrice Winner is well known for her work on molluscan egg cases, with her *Field Guides to Molluscan Spawn*. In her latest offering she takes her interest a step backward to *The Sexual Behavior of Mollusks, Land—Freshwater—Sea*. The book is a compilation of reports, often amusing and always interesting, on the reproductive anatomies, stratagems and peculiarities of molluscan sex life. Self published, the book is spiral bound with a laminate cover and 123 + v pages. It is available from the author, at E.B.M., P.O. Box 14923, North Palm Beach, FL 33408-5328. The cost is \$19.00 = p/h \$3.00. Make check to B. Winner. Get yourself a copy, for fun or for study! We'll be reviewing it in the December issue and on Conch-L.

Academy of Natural Sciences Appoints Fricker

The Academy of Natural Sciences of Philadelphia has appointed Charlene A. Fricker as Collection Manager in the Malacology Department, effective September 1, 1999. Charlene received her Master's degree in Geology from Purdue University in May 1999. She did her thesis on fossil mollusks of Seymour Island, Antarctic Peninsula, working with Dr. William J. Zinsmeister. At the Academy she will work under the guidance of Dr. Gary Rosenberg, with responsibility for computerizing and maintaining the Recent mollusk collection, supervising curatorial assistants and volunteers, and handling loans and requests for information about the collection. She may be reached at 215-299-1173 (fax -1170) or fricker@acnatsci.org.

The former collection manager, Edward S. "Ned" Gilmore has transferred within the Academy to become collection manager for vertebrate biology, and can be contacted as needed.

The VII Reunión Nacional de Malacología (VII National Malacological Meeting-Mexico) VII RENAMAC, is going to be held in Tepic, Nayarit, México, Nov. 9 to 12, 1999. The meeting is organized by Universidad Autónoma de Nayarit, Zoological Mexican Society and Mexican Malacological Society. Contact Dr. Consuelo Esperanza López, Universidad Autónoma de Nayarit, Tepic, Nayarit. Email: consuel@mar.icmyl.unam.mx

For additional information:

<http://www.angelfire.com/mo/moluscos/index.html>;

<http://cib.uaem.mx/zoo.htm>

(Eichhorst continued from page 24)

shells with flaws carefully hidden in the photograph, and shells that never arrived (**none** of this happened on the shell specific sites).

3. Know your shells, know your shells, know your shells. I have seen a gem, \$350 *Conus victor* sell for \$45! But I have also seen a fine or fine- *Strombus listeri* worth less than \$8 sell for \$45! Know what a shell is worth and set a personal limit on the price you are willing to pay. Don't let "auction fever" take over.

4. Have fun! If you go slow and are willing to take a small chance now and then, online auctions can be fun and rewarding. I recently bought a box of assorted shells from an individual who had been given the box as partial payment for some work he performed. Out of the 50 shells (for \$50) there were 20 that were only good for driveway gravel, 20 common shells in nice shape but with no data, 9 nice shells with good data, and one beautiful cone worth the price by itself. However, if you want to be sure you get exactly what you order, stick with established shell dealers or the shell specific sites.

Internet Shell Specific Auction Sites

Bret Raines' mollusc.net: [www://molluscs.net/](http://www.molluscs.net/)

Hawaiian Shell News: www://hits.net/~hsn/

George Sangiouloulou: www://geocities.com/~sangioul/exchange.html/

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DECEMBER 1999

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In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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MEMBERSHIPS are for the calendar year, January-December, late memberships retroactive to January. **1999 DUES:** (USA) \$20.00; **Postal Surcharge:** \$5.00 for Canada and Mexico; \$10.00 for other Western Hemisphere nations; \$12.00 for Europe; \$15.00 for Asia, Africa and the Pacific Rim. Please pay in U. S. dollars, or with a check on a U.S. bank with Transit Enrouting and Account Numbers printed at the bottom, or with money order; make checks payable to CONCHOLOGISTS OF AMERICA. **NEW MEMBERS AND ADDRESS CHANGES** go to Doris Underwood, MEMBERSHIP DIRECTOR. **RENEWALS** go to TREASURER, Bobbie Houchin. **BACK ISSUES** are available from PROPERTIES DIRECTOR Hank Foglino, 4 Trent Court, Smithtown, NY 11787-1266. Prior to 1985 \$3.00 each; 1985 to current \$5.00 each.

PRESIDENT'S MESSAGE

The long days of summer are over. The time has changed. The long, ambling, barefoot walks on the beach are over for another year. Now it's time to get down to serious beach and shallow water shelling. So dig out the waders, furlined hats with ear flaps, and dip nets, set the alarm for 4 A. M. (that's when the best low winter tides occur) and go shelling. When you get home with your treasures you can curl up with a hot toddy and read this issue of *American Conchologist* while you thaw.

While you were out chasing winter mollusks (I say "chase" because in the winter we move at about the same pace as the snails.) Lynn has been working to bring you another superb issue. Lynn is not the only board member working. Others are too. Karlynn is revising the Convention Guidelines and updating the Bylaws. Jim and Bobbie are haggling over what we can spend and can't, mostly can't. Tom is compiling a booklet of past convention contracts for convention hosts to use as guidelines. Donald is keeping shows supplied with trophies. Hank has e-mail so he can handle your orders more efficiently. Doris is ripping open envelopes full of dues. Betty is contacting clubs. Gene is working on the scrapbooks and trying to identify members in all the convention photographs. Jose is spreading the word about COA all over the world. Jean has written the minutes and sent them out in a timely manner. Gary is preparing for another group of grant applicants and Dave is on hand for all of us. Ann is still working on our tax exempt status. Keep your fingers crossed. Jim and I traveled to Starkville, Mississippi to receive a collection donated to COA. There will be more about this in the next edition.

I hope you have Houston on your calendar for June. It looks like a great convention!

Linda

BOARDTALK

From **Doris Underwood**, Membership Chairman: In the midst of all the holiday activities and the prospect of Y2K—don't forget your COA dues! Look at the year printed on the label above your name on the envelope. It tells what year your dues are paid for. Please send yours in promptly. Thanks! and have a safe, wonderful, joyous holiday season!

**We are pleased to announce that COA has been granted
501C(3) status, effective immediately.**

Your end-of-the-year gifts to COA will be tax deductible.

**We also wish to extend grateful thanks for a job well
done to Ann Buddenhagen and Bobbie Houchin!**

COVER: Another of the talented Charlotte Lloyd's lovely photos from the "Red Cones" trip this summer to the Bahamas and Bimini. (See *Am Conch* 27(3) September, 1999) Charlotte brings us face to face with the Little Knobby Scallop, *Chlamys imbricata*, straight from the reef at approximately 50' depth. Thank you, Charlotte, for sharing this experience with us. Charlotte can be reached at clloyd6888@aol.com or 1010 N. 24th Street, Jacksonville Beach, FL 32250-2883.

COA 2000 !!!!! JOURNEY TO THE STARS HOUSTON JUNE 21 - 27

The first of the new millenium!!! Field trips to two fine shell museums are on the agenda. The preconvention field trip will include visits to the Mildred Tate Hall of Malacology at the Brazosport Museum of Natural Science. A very impressive collection of shells from the Texas side of the Gulf of Mexico is displayed. Lunch will be provided at Quintana Beach. This gives an opportunity for collecting or just relaxing by the surf. A special treat will be a stop at Sea Center Texas. This eleven million dollar Texas fish hatchery features aquariums with fish found in Texas bays, rivers and lakes, caught off Texas beaches and from offshore in the Gulf.

An evening visit to the Strake Hall of Malacology at the Houston Museum of Natural Science is scheduled. The display of worldwide shells is outstanding and beautifully displayed. This museum is very actively conducting malacological research.

A field trip to Galveston Island includes a very special visit to a University of Texas research laboratory which has been studying the neural system of cuttlefish and squid. These cephalopods have a massive neural track that is aiding in the study of spinal cord injuries. You will have an opportunity to view historic Galveston before enjoying Moody Gardens with its new aquarium.

18 Prism Cove Place, The Woodlands, TX 77381 <whsharp@pdq.net>

Our convention meetings will be held at the spacious Wyndham Greenspoint Hotel. It is situated at the intersection of I-45 and Sam Houston Parkway, just 20 minutes north of downtown Houston and 10 minutes from Bush Intercontinental Airport and 60 minutes from Hobby Airport. Complimentary airport shuttle service from Intercontinental Airport and/or complimentary covered parking will be available. Exercise facility, golf and tennis are available nearby. The hotel has an outdoor swimming pool and sun deck. Rooms with double/doubles, standard kings, sitting room kings or suites are available at very attractive rates. Room phones are equipped with dataport and voice mail. Rooms have coffee pots and coffee, week-day newspaper, hairdryer, and other expected amenities.

Outstanding meetings have been scheduled. The auctions, oral and silent, will provide an opportunity for all to enhance their collections and mingle with fellow members. The Bourse, as usual, will be fantastic! Lucy Clampit is managing this big event. She may be reached at 713-468-0610 or <lclampit@wt.net>

The Monday evening banquet will be a special beginning for our next thousand years. A special speaker is being planned in keeping with our JOURNEY TO THE STARS theme. The banquet should be a skyrocket occasion!

Come to Houston in 2000!! The home of the astronauts and Space Center Houston may even lead to collecting in this new millenium on some beaches in outer space. Make your reservations early. See y'all!!!!

—Harry Sharp, Publicity Chairman, COA 2000

PEANUT ISLAND

by Beatrice E. Winner

Peanut Island is under environmental restoration. For years, Peanut Island, a small man-made island, struggled as non-native vegetation took over the native hammock. But now Peanut Island will soon be home to an 87-acre eco-tourism park, a wilderness where visitors can safely enjoy the island. Shellers will be able to stay overnight if they so choose.

By spring of 2000, all of the environmental enhancement projects will be in place. At present there is a 19' boat dock and picnic tables. Here's a look at what's being built for Palm Beach County's newest eco-tourism park. Peanut Island recreational features will include a 170' T-shaped fishing pier, two restroom buildings with showers, 20 overnight primitive campsites, six picnic pavilions, 60 picnic tables and grills, a visitors' center and caretaker's residence, a 20' lighted walking path circling the 87-acre island, and removal of all non-indigenous trees and shrubs, replaced by native, environmentally safe flora. The John F. Kennedy Bomb Shelter has been restored. There will also be a shallow water reef and lagoon habitat for snorkeling and scuba diving.

342 Southwind Drive 101, North Palm Beach, FL 33408

PALM BEACH IS BACK!

Palm Beach County Shell Club is back with a show for the New Millenium. Dates are March 24-26. The show will be held across from Peanut Island and near the gambling cruise docks. A great time for a vacation to the Palm Beaches...unique trophies and dealers' tables. For more information, rules and categories see our website at <http://www.gopbi.com/community/groups/PBCshell>

LETTERS TO THE EDITOR:

Haustellum cabritii Prey

In the September 1999 issue of *American Conchologist* on page 9, Robert Robertson writes about "A Spiny Murex," *Haustellum cabritii* and notes... "nothing definite is yet known about the food and methods of feeding of this *Murex*."

In October, 1974 while night diving off Fort Lauderdale, Florida at 70 feet on sand bottom, I saw *Haustellum cabritii* atop the sand. When I picked it up it was with a bit more resistance than expected because it was attached to *Arcinella cornuta* Conrad, 1866 (Chamidae) hidden under the sand. Then in May 1977 on a night dive off Dania, Florida, I saw one valve of an *Arcinella cornuta* protruding above the sand. When I pulled it up to see if both valves were intact, I found that this Florida Spiny Jewel Box was intact, alive, and had a *Haustellum cabritii* attached to it while hidden upside down under the sand.

Surely *H. cabritii* feeds on more than one molluscan species but *A. cornuta* is the only prey which I've observed.

Gene Everson

500 Nottingham Pkwy
Louisville, KY 40222-5026

Flowers to

Herb Young who is in treatment for cancer, but says he's hoping to be at Houston in 2000!

Rosalie Taylor who is very ill. Rosalie, we miss you!

OOPS!

Robert Robertson's article in the September *American Conchologist* had a severe attack of the Gremlins! The murex pictured on page 9 is quite obviously not *Haustellum cabritii*. It is, instead, *Haustellum ruthae* from the Panamic province. And the drilled bivalve is, of course, *Codakia orbiculata*. Your editor, your photo editor and the author all claim equal credit for this fiasco.

Family: Neritidae—Nerites

by Tom Eichhorst and Bruce Neville

The family Neritidae Rafinesque, 1815, commonly called nerites, is present in almost every shell collector's home. We pick up these small, often brightly colored and intricately patterned shells in tide pools, on logs, on trees, and on rock rubble along the shore. So where do we go to read up on this common, well-known family? Well, at the present time, there is no definitive treatment of the Neritidae. If we want information about nerites we have to rely on general shell books and articles in periodicals.

The name "nerite" seems to come from either *Nereus*, a god of the sea in Greek mythology, or *Nereides*, any one of his 50 sea nymph daughters, or his son, *Nerites*, who was changed into a mussel by Aphrodite because he would not go with her when she abandoned the sea. In any case, it has to do with the sea, and the term *neritic* is applied to the shallow waters adjoining the coast, the most common nerite habitat.

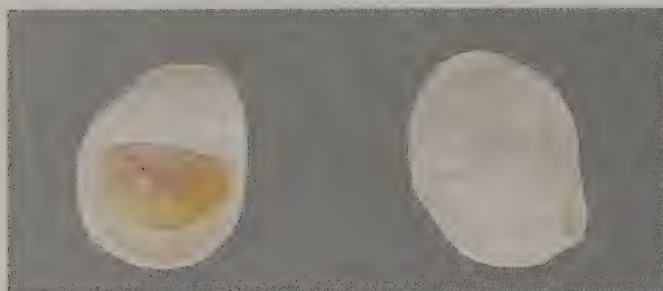


Fig. 1

Newly discovered deep-water nerite, *Bathynertia naticoides* Clarke, 1989, 12mm. Note the thin, chitinous operculum.

Photo courtesy of Jose Eduardo Moreira.

There are approximately 19 genera, 31 subgenera, and over 150 species of Neritidae. Abbott and Dance's *Compendium of Seashells* states there are only about 50 species; Sally Diana Kaicher in her *Card Catalogue of Worldwide Shells* (pack #47, Neritidae) lists 106 species; Guido Poppe's web page lists 187 species; and Eisenberg in *A Shell Collector's Guide to Seashells of the World* states there are hundreds of species. The most commonly encountered genera are *Clypeolum* Récluz, 1842, *Nerita* Linnaeus, 1758, *Neritina* Lamarck, 1816, *Neritodryas* Martens, 1869, *Puperita* Gray, 1857, *Septaria* Férussac, 1807, *Smaragdia* Issel, 1869, and *Theodoxus* Montfort, 1810. The subgenus *Clithon* Montfort, 1810, is often given generic status but is considered here as a subgenus of *Theodoxus*. The genus *Nerita* is one of Linnaeus's original genera, and he seems to have had a fairly good concept of the group; nearly all of his "*Nerita*" are still neritids, although he did include a couple of naticids and *Purpura patula* (Linnaeus, 1758). The family Neritidae is in need of revision as there are numerous synonyms and very likely unnamed subspecies or even species, even among the common nerites. This article makes no attempt at revision or a complete listing of genera or species. What we are presenting is an overview of the family with some natural history and maybe a bit of help in identification.

One of the problems in identifying the various species of nerites is the very colors and patterns that make the shells so appealing. Many nerite species are polymorphic; that is there are numerous colors and patterns found in the same species. This is the case with *Nerita chamaeleon* Linnaeus, 1758; *Neritodryas dubia* (Gmelin, 1791); *Neritina waigiensis* Lesson, 1831 (synonym, *Neritina communis*); *Theodoxus oualaniensis* (Lesson, 1831); *Neritina virginea* (Linnaeus, 1758); and a host of others. Ross Gundersen and Russell Minton demonstrated an unusual example of polymorphism in the species



Fig. 2

Unnamed *Septaria* species from 300 meters deep, off Balicasag, Philippines. Note the small circular scars left by egg capsules and the thin, chitinous operculum. Photo courtesy of Guido Poppe.

Puperita pupa (Linnaeus, 1758) and *Puperita tristis* (Orbigny, 1842) in an article in *American Conchologist*, December 1997. They showed that the typical black-on-white zebra pattern of *Puperita pupa* shifted and new growth was now the white spots-on-black pattern of *Puperita tristis* when the *Puperita pupa* was taken from its salt-water environment and placed in a freshwater environment. Similarly, the freshwater *Puperita tristis* changed from its normal mostly black coloring into black stripes on white when kept in a salt-water environment. DNA studies showed the two species to be very similar; however further analysis and experimentation are necessary before reaching any firm conclusions. Complicating matters in nerite identification are the many named and misnamed species that look very similar. As an example, a morphologic description of *Nerita balteata* Reeve, 1855; *Nerita birmanica* Récluz, 1844; *Nerita grayana* Récluz, 1844; *Nerita lineata* Gmelin, 1791; *Nerita nigrita* Röding, 1798; *Nerita semirugosa* Petit, 1841; and *Nerita undata* Linnaeus, 1758; would be almost identical for all six shells. They are all very similar in appearance and there is at least one synonym involved here, maybe more. *Nerita lineata* is synonymous with *Nerita balteata* according to Abbott and Dance, and to *Nerita birmanica* according to Kaicher. For the collector this means a bit of confusion, but certainly not enough to warrant staying away from these pretty little shells. Despite the problems just mentioned, most nerites can in fact be properly identified.

Nerites are prosobranch gastropods (one gill in front of the heart) and are typically small (the vast majority are less than 25mm) with semi-globose shells. They are well represented in the fossil record, are probably identifiable as far back as the Ordovician period (440-500

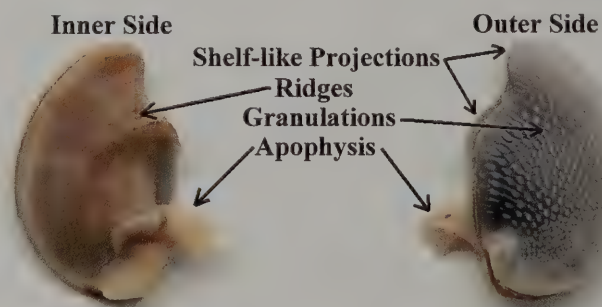


Fig. 3

Typical nerite operculum showing the apophysis and other structures useful for identification. Scan by Tom Eichhorst.

million years ago), and were flourishing by the Devonian period (350-400 million years ago). At present, they are numerous and widespread, most inhabiting tropical and subtropical intertidal rocky areas and shallow waters, a harsh habitat with great fluctuations in temperature and low tidal periods with no water. Many are at home in brackish and even fresh water, and there are records of species living in forested areas quite a distance from water. *Neritodryas subsulcata* (Sowerby, 1836), *Neritodryas cornea* (Linnaeus, 1758), and *Neritodryas dubia* have all been found far from water in forested areas, often from 10 to 20 feet up in the trees. There is also at least one nerite that inhabits the deepest ocean depths. The deep-water nerite *Bathynnerita naticoidea* Clarke, 1989, is found at depths of 500 to 1,000 meters around hydrocarbon seeps off the Louisiana coast in the Gulf of Mexico (Fig. 1). There was also a nerite recently caught in tangle nets from over 300 meters depth in the Philippines. It is as yet unidentified but according to Guido Poppe, who acquired the shell, it is shaped like a *Septaria* species (Fig. 2). So this family we think of as intertidal is actually found from ocean depths of 1,000 meters; up through the intervening depths to the intertidal zone; into brackish waters of river and stream mouths; on up into freshwater rivers, streams, and lakes; on the shorelines of both salt and freshwater; and in the arboreal environment of trees! This is an incredible success story of an opportunistic mollusk family.



Fig. 4
Operculum of *Neritodryas dubia* (Gmelin, 1791) showing the double apophysis. The close-up portion has been rotated slightly (the top portion away from the reader) to show the cavity where the apertural tooth fits. Scan by Tom Eichhorst.

Nerites come in a multitude of shapes, sizes, and colors (although white, black and brown predominate). There are nerites that are solid black (*Nerita melanotragus* Lamark, 1822), nerites that are solid white (*Nerita plicata* Linnaeus, 1758), and others with almost any color imaginable (*Neritina virginea*). There are nerites with murex-like spines (*Theodoxus coronatus* Leach, 1815), nerites that are smooth and glossy (*Nerita polita* Linnaeus, 1758), nerites with heavy ribbing (*Nerita grossa* Linnaeus, 1758), and nerites with a scale-like covering (*Nerita exuvia* Linnaeus, 1758). There are nerites with thin, delicate shells (*Neritodryas dubia* Gmelin, 1791), nerites with thick, heavy shells (*Nerita textilis* Gmelin, 1791), and nerites that discard all but the final whorl, sealing off the lost chambers and giving the shell a sawed-in-half look (*Theodoxus retropictus* Martens, 1878). It seems there is an exception to almost any morphological characteristic that could be used to describe this family.

Keeping in mind that almost every general statement about this family has exceptions, there does seem to be some shell specialization based upon habitat. A thin, smooth shell is usually associated with freshwater species while a thick shell with heavy spiral cording is usu-

ally associated with ocean shoreline dwellers. An exception? In the Caribbean you can find the thin, smooth-shelled *Puperita pupa* inhabiting the same rock as the thick-shelled, heavily corded *Nerita peloronta* Linnaeus, 1758 and *Nerita versicolor* Gmelin, 1791. According to Geerat J. Vermeij in *A Natural History of Shells*, at least some of these differences are attributed to a need to control heat gain and limit moisture loss. The shell is mostly hollow inside because the animal absorbs the inner spiral chambers, leaving a large open cavity. Using this large cavity or chamber, a nerite stores quite a bit of water that may be used for evaporative cooling along the edge of its foot while exposed to the heat of the sun. Following this line of reasoning, most species that inhabit deeper waters have a large aperture and a flatter shaped shell, and those subject to the regular drying out and high temperatures of the mid to high tidal zones have smaller apertures and a more globose, almost spherical shape. Again, exceptions abound.

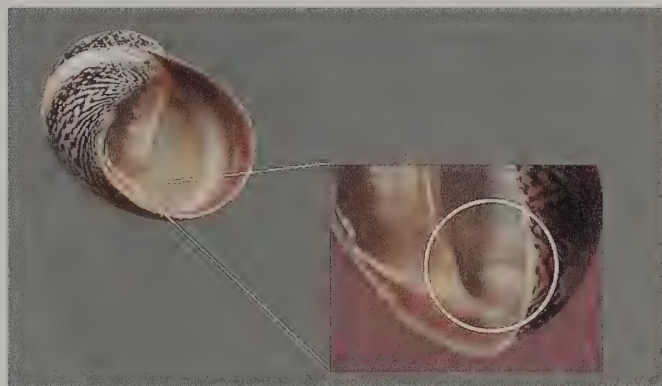


Fig. 5
The aperture of *Neritodryas dubia* with a close-up view of the internal tooth that fits into the double apophysis on the operculum. Scan by Tom Eichhorst

The aperture of the nerite is half-moon shaped and may have teeth on both the outer and inner lips, or one or both may be smooth. There is no umbilicus and many species have a callused platform on the columella that is often denticulate or wrinkled. A periostracum may or may not be present. Many nerites totally lack a periostracum (*Nerita plicata*), others have only a thin covering (*Nerita exuvia*), and still others have a persistent, dark periostracum that completely obscures the shell pattern and color (*Theodoxus corona* (Linnaeus, 1758)). However, the nerite structure with the most variability is probably the operculum.

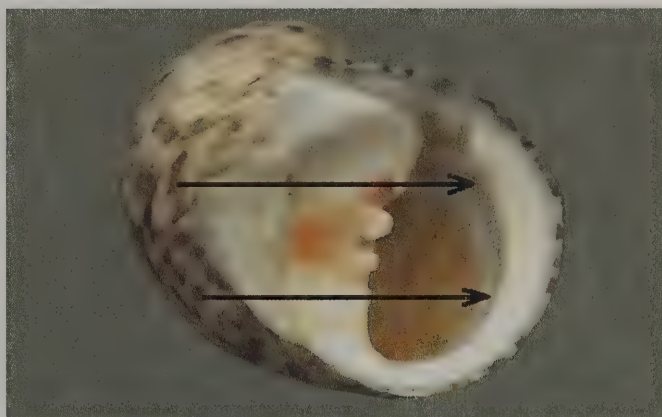


Fig. 6
The aperture of *Nerita peloronta* (Linnaeus, 1758). The arrows point to the internal ridge used to help secure the operculum. Scan by Tom Eichhorst

The aperture of most nerites can be completely closed by a thick and calcareous operculum (Fig. 3). The color of the operculum varies from almost white to beige or dark gray and it is usually granulate, although some are smooth. The distinguishing feature about a nerite operculum is an apophysis or hooked, finger-like appendage. The apophysis is used for muscle attachment and is located inside the shell when the operculum is closed, helping lock the operculum in place. Most nerite opercula also have smaller, shelf-like protrusions on the "hinge" side of the operculum and at least one has a forked apophysis (*Neritodryas dubia* - Fig. 4). This forked apophysis fits over a tooth located well inside the aperture in a manner very similar to some bivalves and their interlocking teeth at the hinge area (Fig. 5). Other nerites (*Nerita peloronta*) have a ridge or thickened area inside the aperture on the outer lip that serves like a doorjamb to a door in helping the operculum close tightly (Fig. 6). All of these characteristics help the animal achieve a very tight fit of operculum to shell aperture. This is undoubtedly of great benefit in the harsh environment of the splash zone as well as an aid in colonizing the great variety of environments where nerites are found. The characteristics of the operculum like the apophysis, ridges, granulations, and teeth are extremely helpful in identifying nerite species. However, the color of the operculum will sometimes vary within a species and while useful for identification, must be used with caution.

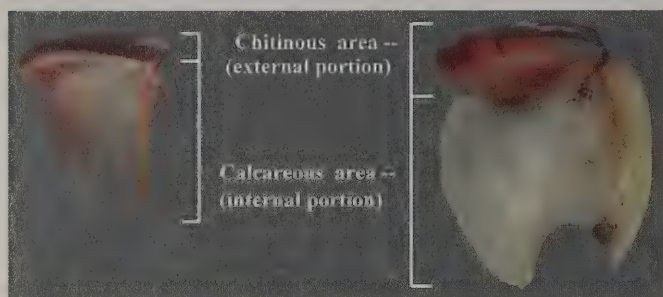


Fig. 7

The unusual opercula of the genus *Septaria*, in this case *Septaria macrocephala* (Le Guillou in Récluz, 1841) (left) and *Septaria sanguisuga* (Reeve, 1856) (right). Scan by Tom Eichhorst

Exceptions to the tight fitting, calcareous operculum are found in the deep-water nerites and the genus *Septaria*. Both of the newly discovered deep-water nerites seem to have a thin, chitinous operculum (Fig. 1 & 2) and the *Septaria* species have an odd, double operculum (Fig. 7). The major portion of the operculum is actually an internal, calcareous structure to which a small, chitinous-looking operculum is attached. From this structure it appears that the thin, chitinous portion is the external part of the operculum while the larger, calcareous portion is internal. This remains conjecture since to date, collectors in the field report no visible signs of an operculum in this genus. Because of this departure from the typical nerite operculum, some authors have proposed a separate family for *Septaria*.

Nerites feed on algae and have a distinctive, many-toothed radula used to scrape food off the surface of rocks, logs, mangrove trees, etc. The teeth worn down by this scraping action are constantly replaced. Like many chitons, most nerites adhere to one spot during the day and only venture out at night to feed—often returning to the same resting spot after feeding. How they find their way back is unknown. When on the move a nerite is able to keep most soft body parts covered by the shell and only the antennae and a bit of the foot need be exposed (Fig. 8). Interestingly, and unlike their neighboring chitons, nerites do not

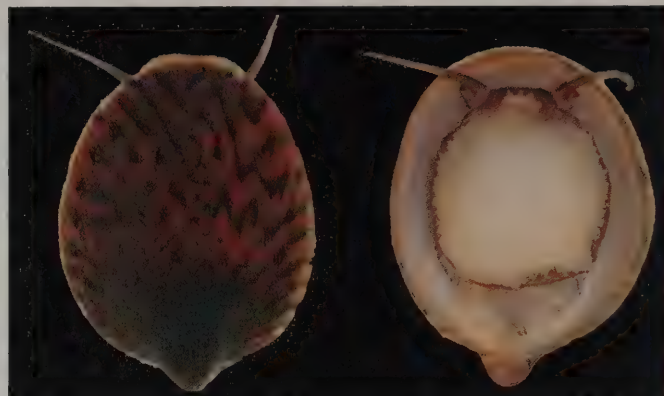


Fig. 8

Dorsal (left) and ventral (right) views of a living *Septaria macrocephala* showing how little of the animal is actually exposed.

Photo courtesy of Don Barclay.

maintain such a tight grip on the rock or other substrate that it is difficult to pull them off. To pull a chiton off of a rock once it knows the attempt is being made is almost impossible without doing major damage to the animal. On the other hand, a nerite will readily come loose and some will even let go of their own volition to escape. Geerat Vermeij reports that hundreds of *Nerita doreyana* Quoy & Gaimard, 1834 in Madagascar would let go and fall off of the rocks as he walked among them.

The sexes are separate, and fertilization is internal, which is unusual among the Archaeogastropoda. The female lays many small, dome-shaped egg capsules on any nearby surface, including rocks, logs, and other nerites, living and dead (Fig. 2). Each capsule can contain up to 100 eggs. In most species, the eggs hatch into a typical free-swimming, four-lobed veliger. A few species apparently have direct development, with the eggs hatching crawling larvae. The Hawaiian freshwater species *Neritina granosa* Sowerby, 1825, *Theodoxus cariosus* (Wood, 1828), and *Theodoxus vespertinus* Sowerby, 1849 are diadromous, i.e., the veligers travel downstream to develop in the sea, but the juveniles and adults return to freshwater.

The greatest variety and number of nerite species are found in the Indo Pacific. However, there are some interesting and brightly colored nerites in the Caribbean and Panamic regions as well. The accompanying illustrations include a number of rarely seen nerites as well as common ones. Every attempt has been made to ensure the species are properly named, and we hope this will help the reader in nerite shell identification.

For the collector, nerites offer several advantages. Their small size means they won't fill up a room or two, and many are easily self-collected. Those species you are unable to self-collect are usually inexpensive to purchase from dealers. Many have bright colors and intricate patterns that rival the more popular cowries or cones. For the self-collector who keeps marine or saltwater fish, most nerites will do quite well in an aquarium and tirelessly work to keep algae under control.

A final note. There is a closely related family, Neritopsidae with a single living genus, *Neritopsis*, and only a few living species. *Neritopsis radula* (Linnaeus, 1758) is the most commonly seen representative in collections although it is by no means a common shell. The two families are very similar in appearance. *Neritopsis radula* looks somewhat like *Nerita plicata* on the dorsal side but instead of a half-moon shaped aperture, the opening on a neritopsid shell is large and closer to a three-quarter moon shape.

Plate 1

Sizes and locales are for the specimen pictured. Some specimens are shown with and without the periostracum.

1. *Nerita albicilla* Linnaeus, 1758 - 25mm, Philippines; 2. *Nerita antillarum* Gmelin, 1791 - 19mm, Cuba; 3. *Nerita atramentosa* Reeve, 1855 - 25mm, S. Australia; 4. *Neritina aquatilis* Reeve, 1855 - 15mm, Indonesia; 5. *Nerita ascensionis chlorostoma* Lamarck, 1822 - 24mm, Brazil; 6. *Puperita bensoni* (Récluz, 1850) - 8mm, Mauritius; 7. *Theodoxus brevispinus* (Lamarck, 1818) - 17mm, Japan; 8. *Theodoxus cariosus* (Wood, 1828) - 16mm, (brackish water) Hawaii; 9. *Nerita chamaeleon* Linnaeus, 1758 - 24mm, Malaysia; 10. *Neritina clenchi* Russell,

1940 - 14mm, Florida; 11. *Nerita costata* Gmelin, 1791 - 20mm, Philippines; 12. *Theodoxus corona* (Linnaeus, 1758) - 18mm, (freshwater) Samoa; 13. *Neritina coromandeliana* Sowerby, 1832 - Philippines; 14. *Neritodryas cornea* (Linnaeus, 1758) - 27mm, Philippines; 15. *Theodoxus coronatus* (Leach, 1815) - 25mm, Mauritius; 16. *Neritina crepidula* Lamarck, 1822 - 13mm, Philippines.

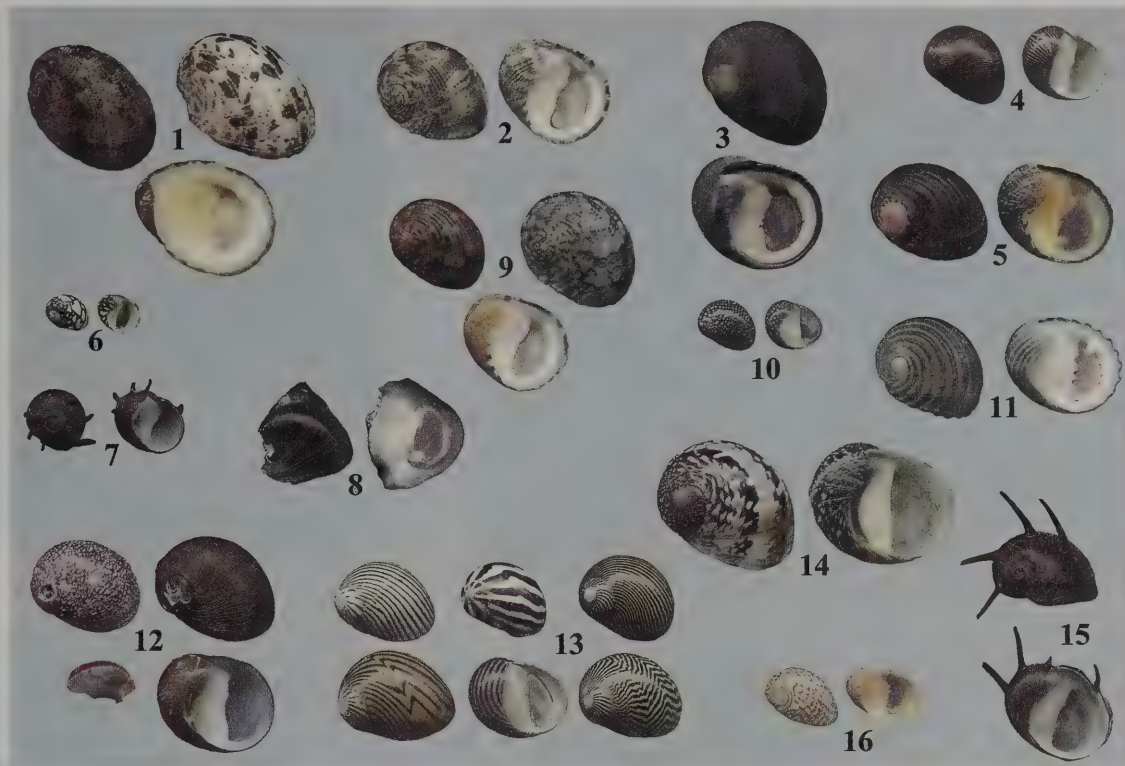


Plate 2

17. *Neritina chlorostoma* Broderip & Sowerby, 1833 - 18mm, (freshwater) Samoa; 18. *Neritodryas dubia* (Gmelin, 1791) - 20mm, Philippines; 19. *Nerita exuvia* Linnaeus, 1758 - 25mm, Philippines; 20. *Septaria freycineti* (Récluz, 1842) - 20mm, (freshwater) Samoa; 21. *Nerita fulgurans* Gmelin, 1791 - 25mm, Florida; 22. *Nerita funiculata* Menke, 1851 - 17mm, W. Mexico; 23. *Clypeolum granosum* (Sowerby, 1825) - 28mm, (freshwater) Hawaii; 24. *Nerita grossa* Linnaeus, 1758 - 27mm, New Guinea; 25. *Nerita helicinoides* Reeve, 1855 - 18mm, Singapore; 26. *Nerita melanotragus* E.A. Smith, 1884 - 24mm, Queensland; 27. *Neritina meleagris* Lamarck, 1822 - 11mm,

Belize; 28. *Nerita morio* (Sowerby, 1833) - 14mm, Chile; 29. *Neritina natalensis* Reeve, 1855 - 22mm, Mozambique; 30. *Nerita picea* Récluz, 1841 - 17mm, Hawaii; 31. *Puperita pupa* (Linnaeus, 1758) - 10mm, Florida. The two dark colored specimens on the right are *Puperita pupa tristis* (Orbigny, 1842) - (See text).

(Continued on bottom of next page)

The New Banks Shell Collection Aboard the *Endeavor*

by Dan Yoshimoto



The Replica HM Bark Endeavor



Hiromi Yoshimoto in the Great Cabin where Banks and Solander did their work. (Story is on next page)

Plate 3

32. *Nerita peloronta* Linnaeus, 1758 - 27mm, St. Croix (note the uniquely sculptured operculum);

33. *Nerita plicata* Linnaeus, 1758 - 25mm, Guam; 34. *Nerita polita* Linnaeus, 1758 - 29mm, Philippines;

35. *Theodoxus retropictus* Martens, 1879 - 20mm, Japan; 36. *Septaria porcellana* (Linnaeus, 1758) - 22mm, (freshwater) Samoa; 37. *Neritina sandalina* (Récluz, 1842) - 16mm, (freshwater) Samoa; 38. *Nerita signata* Macleay in Lamarck, 1822 - 18mm, Philippines (usually white in color); 39. *Smaragdia viridis viridimaris* (Maury, 1917) - 6mm, Florida (top two) and *Smaragdia rangiana* (Récluz, 1842) - 8mm, Philippines (bottom two);

40. *Neritodryas subsulcata* (Sowerby, 1836) - 18mm, Philippines; 41. *Nerita squamulata* Le Guillou, 1841 - 22mm, Philippines (the black and orange colored specimen is unusual); 42. *Neritina violacea* (Gmelin, 1791) - 20mm, Philippines; 43. *Neritina virginea* (Linnaeus, 1758) - 8mm, Florida; 44. *Theodoxus vespertinus* (Sowerby, 1849) - 22mm, (brackish water) Hawaii; 45. *Nerita yoldii* Récluz, 1841 - 10mm, Korea (the pale areas are eroded away from the normal dark dorsal surface — a typical condition); 46. *Neritina zebra* (Bruguière, 1792) - 20mm, Brazil (note the similarity to *Neritodryas dubia* No. 18, found half a world away).

46. *Neritina zebra* (Bruguière, 1792) - 20mm, Brazil (note the similarity to *Neritodryas dubia* No. 18, found half a world away).

46. *Neritina zebra* (Bruguière, 1792) - 20mm, Brazil (note the similarity to *Neritodryas dubia* No. 18, found half a world away).

46. *Neritina zebra* (Bruguière, 1792) - 20mm, Brazil (note the similarity to *Neritodryas dubia* No. 18, found half a world away).

46. *Neritina zebra* (Bruguière, 1792) - 20mm, Brazil (note the similarity to *Neritodryas dubia* No. 18, found half a world away).

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The New Banks Shell Collection Aboard the *Endeavor*

by Dan Yoshimoto

On August 25, 1768, when the *H.M. Bark Endeavour* sailed out of Plymouth, England, with James Cook as her captain, she had, as her mission, the tracking of the Transit of Venus across the sun. Aboard the ship were two major scientists, Sir Joseph Banks and Dr. Daniel Carl Solander, along with two scientific artists, Sydney Parkinson and Alexander Buchan. The ship, before being refitted for scientific "Voyages of Discovery," had already spent three years as the collier (coal carrier) *The Earl of Pembroke*, carrying coal up and down the Thames River. For the next three years she was to be the first of three ships captained by James Cook as he charted and described an "unknown world."

In the 1960's, the idea of a new ship was conceived in Whitby, England, where the original ship had been built in 1764, but it was not until April 16, 1994 that the *Replica H.M. Bark Endeavour* was completed and commissioned to sail on another Voyage of Discovery and Friendship Tour.

On June 25th, 1999, The *H.M. Bark Endeavour* sailed into Humboldt Bay, California and as she entered the bay, with brilliant Australian flags and tumultuous cannon fire, she was greeted by an excited community awaiting her arrival. When she left, 11 days later, over 5,500 people had been given the experience they had been promised... a "time travel tour" back to the 18th century and a period of exploration.

On the 26th of June, as the first tours were given aboard the ship, I, along with about 20 other "tourists," entered into this "time machine" and, room by room, was guided through her rooms by costumed docents from the community. We toured The Great Cabin where Banks and Solander had spent their time describing and naming new species. The original *Endeavour* had collected many specimens of shells new (at that time) to science. Solander had been a student of Carl Linnaeus, the famous Swedish botanist who had published, just 10 years earlier, his 10th edition of *Systema Naturae* and a first listing of the names of new species of mollusks. (It seems odd that so few of the shells collected by the *Endeavor* were ultimately authored by Banks and Solander. After the expedition, Banks and Solander became so busy working on the Portland Collection and socializing that their

work of identifying the collection from the *Endeavour* was left for others, particularly Lightfoot and Martyn. The Solander manuscripts were left incomplete in 1782.) While we were touring The Great Cabin, I noticed an omission, something that to my eyes as a shell collector, raised some questions: I had thought that The original *Endeavour* had collected many specimens of shells new (at that time) to science. This was indeed a notable conchological event. So where were the shells on this new *Endeavour*?

The following day I made an appointment with First Mate Geoff Kerr, and we discussed the possibility of a "New Banks' Shell Collection" for the ship. He agreed that it would be appropriate. Leaving the ship, I returned home and emailed Conch-L about the idea; there came many positive suggestions for the project, one of which was to contact The London Natural History Museum to see if they had information on the species collected originally. The next day I received a fax copy from a publication by Guy Wilkins of the list of shells from the *Endeavour*. Once again I appealed to Conch-L for interested persons who would like to donate specimens matching the original list. I received wonderful responses from Paul Monfils, Dr. Harry G. Lee and Tom Eichhorst, each of whom provided excellent specimens. Along with my wife's donations, there were now more than 40 specimens collected.

On September 15, 1999, my wife and I packed up the collection and headed north to Victoria, Vancouver Island, Canada to meet with Dee Nolan and Geoff Kerr, who were awaiting the final touches in dry dock of the work on the *Endeavour*. When we reached Victoria, we were met by Dee, who took us to the naval dry docks in Esquimalt to see the ship. Among the other ships, and in a hole about 80 feet deep and several football fields long, *The Endeavour* looked like a toy boat in some child's toy box... miniscule!!!

In November the *Replica Endeavor* docked in Honolulu, Hawaii, carrying a new display, a group of representative shells donated by collectors in the U.S. Yes, there still are many species missing from the collection, but I'm sure, now that a collection has been started, that new specimens will be donated by other collectors wanting to participate in this great adventure.

Readers who would like to know more about the Banks Collection can still purchase Guy Wilkins' *Catalogue and Historical Account of the Banks Shell Collection* by writing to the British Museum (Natural History). It is Historical Series Vol. 1 No. 3 London, 1955.

Shells still not represented are the following: (Nomenclature below is as listed in Guy Wilkins' Catalogue, followed by current status. Grateful thanks go to Harry Lee for unraveling the taxonomic puzzles of this list. He will supply justification and documentation for these nomina at the reader's request.)

Leucozonia brasiliensis (d'Orbigny, 1841) is *Leucozonia nassa* (Gmelin, 1791)

Aulacomya ovalis is *Brachidontes purpuratus* (Lamarck, 1819)

Modiolus falcatus (d'Orbigny, 1846) is *Mytella charruana* (d'Orbigny, 1846)

Modiolus guianensis is *Mytella guianensis* (Lamarck, 1819)

Pinctada vulgaris Schumacher, 1817 is *Pinctada fucata* (Gould, 1850)

Pteria argentia (Reeve, 1857) is *Pteria argentea* (Reeve, 1857)

Tivela trigonella is *Spisula trigonella* (Lamarck, 1819)

Dosinia concentrica (Born, 1778)

Atactodea striata (Gmelin, 1791)

Modiolus auriculatus (Krauss, 1848)

Modiolus metcalfei Hanley, 1844

Cypraea tortilis Martyn 1788 is *Ovula costellata* Lamarck, 1810

Conus eburneus Hwass in Bruguière, 1792

Natirus reflexus is *Notirus reflexus* (Gray, 1843)

Aulacomya maoriana Iredale, 1915 is *Aulacomya ater maoriana* (Iredale, 1915)

Musculus impactus (Hermann, 1792) is *Modiolarca impacta* (Hermann, 1792)

Tridacna gigas (Linnaeus, 1758) (seen but not collected)

Amygdalum arborescens (Dillwyn, 1817) is *Amygdalum arborescens* (Mühlfeld, 1811)

Lithophaga teres (Philippi, 1846)

Mytilus lithophagus is *Lithophaga lithophaga* (Linné, 1758)

Mytilus pinnulatus is almost certainly *Mytilus planulatus* Lamarck, 1819

Crenatula nigrina Lamarck, 1819

Electroma georgiana (Quoy & Gaimard, 1834)

Electroma punctulata is *Electromya scalpta* (Reeve, 1857)

Austropteria lata is *Pteria lata* (Gray, 1845)

Pinctada reeveana (Dunker) is *Pinctada albina sugillata* (Reeve, 1857)

LABELS FOR FOSSILS

by Andrew Rindsberg

Here are some remarks on writing paper labels for fossils, modified from a guidebook for teachers in Alabama (Kopaska-Merkel and others, 1998). Obviously, they could also apply to modern shells with a few modifications, such as including the water depth.

If you are rewriting labels connected with an older collection, always keep the original labels as well. If you add information to the new labels, do so in square brackets to make it clear that this is not part of the original collection data, e.g., "Livingston University [now University of West Alabama]," and make it clear when you are guessing, e.g., "[Collected about 1985?]." This prevents error from accumulating, and maintains a historical record that often answers questions that would be very difficult otherwise. For instance, handwriting may reveal who collected a shell even if the label lacks the collector's name. When writing new labels, use stable ink or pencil. India ink and most ballpoint blue inks are relatively stable; most ballpoint black inks spread and redden after a few years. Use acid-free paper with a high rag content (such as most good stationery) to prevent slow deterioration of the shell. Include at least the following information on new labels.

Name of institution: e.g., "Geological Survey of Alabama," "Selma High School," "Collection of Mary Billings." This makes a good header for the label if centered.

Name: Genus, species, e.g., *Exogyra costata*, or a general name such as "bryozoan." More advanced conchologists generally add the name of the species' author and the date of its first publication, e.g., *Exogyra costata* Say, 1820.

Formation: The rock unit from which the fossil was collected. e.g., Prairie Bluff Chalk, Ripley Formation. Common abbreviations: Formation = Fm., Member = Mbr., Sandstone = Ss., Limestone = Ls., Shale = Sh.

Location: This is the single most important item to record. Abbreviate if necessary, or continue on the back of the label. In the long run, it is better to use descriptions rather than numbered localities, e.g., "Truck stop northeast of junction of I-20/59 and AL 28, Livingston, Sumter Co., AL," "AL 17 4 mi. N of courthouse, Butler, Choctaw Co., AL," "Alabama River at US 84 bridge, Monroe Co., AL," "Jones Bluff, Tombigbee River, Sumter Co., AL."

By convention, "4 miles north of Livingston" means "4 miles north of the center of Livingston," ordinarily measured from the courthouse or the most central road intersection. Do not use it to mean "4 miles north of the Livingston city limits," which can change from year to year.

Always describe the location in terms that someone could understand many years from now. Avoid measuring distances from gasoline stations or groceries, which do not last forever, or by mile/kilometer markers, which change every time the road is straightened. Do measure distances from relatively permanent landmarks such as churches, centers of bridges, and road intersections.

Collector: You can use initials if many specimens have the same collector. Make sure that at least some labels have the full name. However, specimens that are sent to other people should always be labeled with your full name.

Date: Date of collection.

Field no.: The number (if any) written on the bag or specimen at the time of collection. This varies from person to person, though most people precede the number with their initials to avoid confusion. Commonly used methods include:

(1) Sequential for a lifetime: 1, 2, 3, ... Simple, but better keep track of the last number you used!

(2) Sequential for each year: 97-1, 97-2, 97-3, ... Even very active collectors rarely use more than 300 field numbers in a year. Again, keep track!

(3) Coded by date. The third stop (or third sample) on August 16, 1997, would be coded as 97-8-16-3. This makes for a longer number, but the date need not be written again on the bag, and there is no need to look up the last number.

More complex methods than these usually fail.

Catalog no.: The final number, if any, given to the washed and labeled specimen in the school museum or other collection.

Remarks: It is often helpful to leave some space for miscellaneous remarks.

Reference

Kopaska-Merkel, D. C., Rindsberg, A. K., Thurn, R. L., DeJarnette, Sydney, Puckett, T. M., and Allen, Ashley, 1998, Cretaceous of west-central Alabama: a hands-on fossil workshop for teachers (2nd edition): Geological Survey of Alabama Educational Committee, Field Trip Guidebook 3, 66 p.

SELMA HIGH SCHOOL

Name _____
 Formation _____
 Location _____
 Collector _____ Date _____
 Field no. _____
 Catalog no. _____
 Remarks _____

SELMA HIGH SCHOOL

Name *Exogyra ponderosa* Roemer, 1849
 Formation Mooreville Chalk
 Location Valley Creek west of Selma Jr. High School,
 Selma, AL (GSA Loc. 1809)
 Collector J. A. Smith Date 3/16/1989
 Field no. JAS 89-3-16-4
 Catalog no. 1809-5
 Remarks See JAS field notes, p. 135

COA TROPHY WINNERS

edited by Charlotte Lloyd

On September 18-19 Hurricane Floyd threatened to cancel the Central Florida Shell Show. However, with two days' notice that there would be a show, exhibitors came, and Jim Vun Kannon carried home the COA for his beautifully displayed "Bahama Out Islands." This exhibit had it all—photographs, educational material, and wonderful shells.



The Jacksonville Shell Show returned to Jacksonville Beach to the delight of members and visitors alike this July 31-August 1. The judges presented Theresa St. John with her first major award and she couldn't have been happier. She won the COA Award with her eight cases of "Beautiful Cowries."



Jean Offord won the prestigious COA Award at the Keppel Bay Shell Show on July 10-11, 1999. Jean's exhibit, "Shells and Their Environments," showed various shells and their habitats. This attractive exhibit was displayed on tiers in a 3' X 4' area. Good job, Jean!



COA Member Vicki Wall won her trophy at the North Carolina Shell Show held on September 10-12 of this year with a most outstanding 12 foot exhibit. This exhibit, entitled "Invasion of the Exotic European—the Zebra Mussel," was viewed by more than 1,700 visitors. The display included photos, maps, environmental posters and growth series. Congratulations and great job, Vicki, on educating the public about this invasive mollusk.

Shells on the Internet

by Tom Eichhorst

Previously I discussed Internet sites where you can read about shells, see pictures of shells, and buy shells at auction. This time things are a bit different. The first site I will introduce is very much shell related, **Cone Shell — Conotoxins**, authored by Dr. Bruce Livett of the University of Melbourne. The next two sites have nothing to do with shells directly, but can be invaluable to a shell collector. The first of these is **Alta Vista Translations**, a wonderful site that presently offers translations of six different languages. This can be pretty handy if you have done a search looking for an obscure land snail and the top site is in German. The third site is **The Library Spot**. Here you will find the resources you expect to find in a library plus a few extras.

Cone Shell — Conotoxins

<<http://grimwade.biochem.unimelb.edu.au/cone/>>

In the June, 1999 issue of "American Conchologist" I reviewed the Jacksonville Shell Club Home Page and stated that one of my favorite items on the page was the article by Dr. Harry Lee on human infection, poisoning, and envenomation by mollusks, "Mollusks and Man — A Medical Perspective." The first web page reviewed in this issue takes a portion of Dr. Lee's subject and thoroughly explores it. Dr. Bruce Livett takes the envenomation by cones and the family Conidae in general and presents a readable, very interesting site. He takes advantage of the capabilities of the Internet to bring his discussion of cones alive with movie clips, audio clips, 3D images, numerous links, and lots of information. You can watch several motion clips of a cone attacking and swallowing a fish or another mollusk or a cone laying eggs. There are galleries of different *Conus* species, cone shells on stamps, and numerous links to other web sites having to do with cones and conotoxins. My one criticism of the site is with the gallery of cone shell images. About 50 different *Conus* species are pictured but some of the images are out of focus. This is pretty minor as Dr. Livett provides links to both Guido Poppe's site, **Conchology**, at <<http://www.conchology.uunethost.be/>> and Eddie Hardie's site, **Internet Guide to Marine Gastropods**, at <http://www.gastropods.com/shell_pages/index.html>. A couple of sites he doesn't reference are **Cone Shells — The Giancarlo Collection**, at <<http://www.geocities.com/coneshells/>>, **Worldwide Specimen Shells** at <<http://www.erols.com/worldwide/>>, or **George Sangioulou's Shell List and Images** at <<http://www.geocities.com/~sangioul/exchange.html>>. Each of these sites has hundreds of excellent pictures of cone shells.

At first glance it seems like Dr. Livett did not include any general information on cones—but it is there. This is a non-linear site and you have to follow the many imbedded links to really discover all that Dr. Livett has to offer. Under the title of "More Information" you are linked to a FAQ (frequently asked questions) file where the basic, and some not so basic, natural history of cones is discussed. This is also where you will find links to other cone-related articles and web pages (try the Giancarlo site for a nice overview of gastropods and the Conidae family). The link section and the "What's New" sections are worth the price of admission. Here you will find much, if not most of the cone-related material on the web. However, it is with the subject of conotoxins that this web page excels.

Conotoxins are covered in detail, with 3D images of different conotoxins, amino acid sequences of conotoxins found in different species as well as differences within a single species, patents on file for conotoxins, and the many medical uses being investigated for conotoxins. There is also a section detailing the fatal and nonfatal cone attacks on humans. Admittedly, some of this stuff gets pretty deep, but it is clearer and easier to understand than most of the referenced scientific

papers used for this presentation. If you want more information you can follow any of the many links to a plethora of articles, read the abstract provided and decide if you need to dig up the original. One of the articles he references is an illustrated account of cones and their toxins in *Pour la Science*, No. 261, July 1999, "Pour paralyser leurs proies, ces coquillages utilisent des venins qui contiennent d'innombrables toxines dont l'action est ciblée." The article, *Cônes et toxines* is authored by Frederic Le Gall, Philippe Favreau and Georges Richard. The abstract is at <<http://grimwade.biochem.unimelb.edu.au/cone/index1.html>>. What? You don't read French? Well then read on as I have the solution to your dilemma.

Alta Vista Translations

<<http://babelfish.altavista.digital.com/cgi-bin/translate>>

This site is the answer to those of us who are language challenged. If you do not understand the quote in the preceding paragraph, just log onto this site, hit a couple of buttons, and you get: "To paralyze their preys (sic), these shells use venoms which contain innumerable toxins whose action is targeted." While not perfect, this will certainly give you the meaning. You can get a translation by cutting and pasting the material in question, or if you discover a web page of interest you can enter the URL and the entire page will be translated, including picture captions. This works from English to French, German, Italian, Portuguese, and Spanish; or from any one of those languages to English. If you want to translate between two non-English languages you are out of luck. You would have to go through English (e.g. French to English to Spanish) and the result would most likely be close to gibberish. There are a few problems with verb tenses and idiomatic expressions, and these would be exaggerated by translating through three languages.

If used as intended, this site is extremely helpful. There are many sites in German and French that I have been able to access and understand using it. However, there is always a chance of a mistranslation; "bags under his eyes" can end up, "suitcases under his eyes." But the bottom line is, this site is very useful and easy to use, and can open up web pages in five different languages. Of course, some words do not translate. Most scientific names of shells will be left as is, but you have to watch it as every now and again a portion of a name will be "translated." The term "babelfish" in the site address is a bit of a joke, but keep it in mind when using this site. Finally, if you are like me, occasionally you will run into words after the translation that you still do not know and that are not in the pocket Webster's on the desk. This next site should help in this case.

The Library Spot <<http://libraryspot.com/today.htm>>

This is literally an online library with many of the features you would expect to find in a normal, open-the-door-and-walk-in type library. The web page opens with some interesting, "this day in history" information, but the really useful stuff is located under the many links provided. Included in the links offered are links to other online libraries, a reading room with magazines and books, lists of top books, news links, government links and finally the links I find most useful: the reference desk and maps.

The reference desk has, among other listings; acronym files, an area called "ask an expert," biographies, calendars, genealogy, quotations, maps, phone books, and of course, dictionaries and encyclopedias. Each of these has multiple links. When you click on dictionaries you get 12 different dictionary sites. This includes a Merriam-Webster Dictionary, dictionaries in 130 different languages, legal and medical dictionaries, and my favorite, the One Look Dictionary. This is a web page that contains 582 searchable, online dictionaries containing almost 3 million words! You merely type in the word you are looking for and the search engine will search for your word in 582 dictionaries. Make sure you select the "all dictionaries" option or your search

2000 WINTER & SPRING SHELL SHOWS & OTHER EVENTS

by Donald Dan, COA Awards Chairman

- Jan. 22-23 **Space Coast Shell Festival**, Melbourne, FL
The Melbourne Auditorium, 625 E. Hibiscus Blvd.
Jim & Bobbi Cordy, 385 Needle Blvd.
Merritt Is., FL 32953
E-mail: cordy@yourlink.net (407) 452-5736
- Jan. 29-30 **Greater Miami Shell Show**, Miami, FL
Elks Lodge #1888, 6304 SW 78th Street, South Miami
Elizabeth Brown, 9359 Fontainebleau Blvd. Apt. 107F
Miami, FL 33172-4278
E-mail: bebe1066@aol.com (305) 229-0228
- Date **XIIIème Recontres Internationales du Coquillage**
pending Espace de Blanc Manteaux, Rue des Blanc
Manteaux, Paris, France
M. & D. Wantiez, 88, Rue du General Leclerc
95210 Saint Gratien, France 33 (1) 34-17-00-39
- Feb. 5 - 6 **Broward Shell Show**, Pompano Beach, FL
Pompano Beach Recreation Center,
NE 18th Av. & NE 6th St.
Wayne Harland, 2722 NE 3rd Street
Pompano Beach, FL 33062
E-mail: wharland@gate.net (954) 970-3356
- Feb. 11-13 **Sarasota Shell Show**, Sarasota, FL
Sarasota Municipal Auditorium, Tamiami Trail
Lynn Gaulin, 3417 58th Ave.
W. Bradenton, FL 34210
E-mail: ehgaulin@worldnet.att.net (941) 755-1270
- Feb. 18-20 **Naples Shell Show**, Naples, FL
The Nature Conservancy, 14th Avenue N.
Howard & Susan Roux, 152 Coral Vine Drive
Naples, FL 34110
E-mail: hsroux@aol.com (941) 514-0541
- Feb. 26-27 **St. Petersburg Shell Show**, Treasure Is., FL
Treasure Is. Community Center
Bob & Betty Lipe, 348 Corey Avenue
St. Petersburg Beach, FL 33706
(727) 360-0586; FAX: 360-3668
E-mail: rlipel@tampabay.rr.com
Exhibits accepted at web site: www.theshellstore.com
- Mar. 2 - 5 **Sanibel Shell Show**, Sanibel, FL
Sanibel Community Center, Periwinkle Way
Richard Willis, 5305 Darby Court
Cape Coral, FL 33904
E-mail: rwwillis@ix.netcom.com (941) 540-7380
- Mar. 9-11 **Marco Island Shell Club Show XIX**, Marco Is., FL
Wesleyan United Methodist Church, Barfield Road
Jean Sungheim, P.O. Box 633
Marco Island, FL 34145 (941) 642-7247
- Mar. 24-26 **Palm Beach County Y2K Shell Show**,
Riviera Beach, FL
Newcomb Hall, 13th St. Marina
Carole Marshall, 932 Cochran Drive
Lake Worth, FL 33461
Email: marshalldg@aol.com (561) 582-2148
- May 6-7 **X Belgium International Shell Show**,
Antwerp, Belgium
Schijnpoort, Schijnpoort Straat
R. De Roover, Vorsterslaan 7
2180 Ekeren-Donk, Belgium 32 (3) 644-3429
- Jun. 17-18 **XIXième Salon International du Coquillage**
College du Gran Pont, Lutry, Switzerland
Dr. Ted W. Baer
CH-1602 La Croix, Switzerland
(21) 791-3771; FAX 792-1411
- Jun. 22-26 **Conchologists of America Annual Convention**,
Houston, Texas
Wyndham Greenspoint Hotel, Greenspoint Blvd.
Exit off Sam Houston Pwy.
Dave & Lucille Green, 12307 Laneview Drive
Houston, TX 77070
E-mail: dgreen@comwerx.net (713) 376-5630

6704 Overlook Drive, Fort Myers, FL 33919 (941) 481-6704
email: donaldan@aol.com

will be limited to the first few found. The results are broken down by the category of the dictionaries, with categories of medical, religion, technological, business, computer/Internet, science, general, miscellaneous, and more. There are several methods of search available and links to even more dictionaries are provided.

If the information you want could be found in an encyclopedia, you have several options. There are links to the *Encyclopedia Britannica* (still under construction), *Funk and Wagnalls*, *Encyclopedia.com*, *Encarta*, and others. Each of these is searchable with a keyword. Also on this page you will find a link to the latest version of the *CIA World Factbook*. This is a listing of countries throughout the world with relevant facts, maps, history, etc.

Finally a word about the map links. There are sites here that will

provide a satellite image of most areas on the planet, maps to pretty much any address, and specialized maps of topography, political boundaries, climate, or environmental occurrences. If you follow the link to the National Atlas of the United States, you will find several maps you can customize with the information you want presented. Among the interesting maps included is an animated map that graphically displays the spread of *Dreissena polymorpha* (the zebra mussel) from its introduction in Lake St. Clair in 1988 to its present spread over almost a third of the United States.

So there you have it. Three sites I find interesting and useful — even if two of them are not directly shell related. Next time we will get back to strictly shell related sites.

Why Work When You Can Steal?

By Erika Iyengar

Editor's Note: See Erika's color photos on the back cover.

How would you feel if, every time you went to sink your teeth into a delicious lunch morsel, some little creature perched on your upper lip, stole it right out of your mouth and ate it? Chances are you would find a way to rid yourself of your little foe or get a lot thinner quickly. We all know that snails are amazing creatures—they can graze, hunt prey and filter feed, some of them are parasites in the darnedest places (including the intestines of sea cucumbers), and now a new talent has been uncovered—some of them are adept thieves!

If you enjoy SCUBA diving in the cold waters off the Pacific Northwest of the United States or if you have been lucky enough to poke around in the intertidal areas of Alaska, you are probably familiar with the "hairy shells," including *Trichotropis cancellata*, a subtidal marine caenogastropod in the superfamily Calyptraeacea. It is a small snail (usually 2–4 cm long) with projections of the periostracum that give it a hairy appearance. It resembles a small version of *Fusitriton oregonensis* (the hairy triton). *T. cancellata* is usually found in rocky areas with moderate to extreme currents, and is often associated with tube-dwelling polychaete worms. Figure 1 shows three snails clustered on a sabellid worm tube. *T. cancellata* was originally described as a suspension feeder (Yonge, 1962), using cilia on its gill to set up water currents. Food particles are trapped in the gill's mucus and moved along a groove to the mouth. Suspension feeding is the dominant feeding mode among bivalves, but is rare with gastropods—although it has evolved at least seven separate times within the prosobranchs (Hickman, 1985). But *T. cancellata* is not just a suspension feeder. It is capable of an even rarer feeding mode: kleptoparasitism. Kleptoparasitism occurs when one organism steals food from another but does not injure the host in any other way. Well-known in some birds, mammals, and insects, there are few instances of it among marine invertebrates. These snails are very adept thieves. When parasitizing, *T. cancellata* sits on the tube of a sessile polychaete worm, extends its pseudoproboscis (basically an elongated lower lip) through the feeding tentacles of the worm and into its mouth. Figure 2 shows a close-up of this, from the snail's perspective. The white tube with a groove is the snail's pseudoproboscis, descending into the worm's mouth in the middle of its tentacles. In short-term feeding bouts, a snail can steal up to one hundred percent of the worm's food, as soon as the worm ingests it (Pernet and Kohn, 1999).

I have been studying the prevalence and benefits of these two types of feeding behavior at the Friday Harbor Marine Labs in the San Juan Islands, Washington. These islands, located northwest of Seattle, are in the middle of *T. cancellata*'s geographic range (Bering Sea to Oregon). My current projects include permanent subtidal transects near San Juan Island. The percent of snails parasitizing is high at all of these sites year-round (on average 71% to 97% of snails are on worms). *T. cancellata* can be tethered (using thread and superglue) and placed next to a worm, where it will remain sedentary, stealing food. Using this tether method, I constructed subtidal racks with snails on worms or on bare rocks (to allow parasitism or to restrict snails to suspension feeding). The snails that were able to parasitize [i.e. were next to a worm] grew significantly faster than those that were restricted to suspension feeding (i.e. were tethered on bare rock). Thus there seems to be an immense growth benefit to being a parasite.

In many host-parasite relationships, the parasite is species-specific, specializing on one host species. However, these snails can parasitize at least five tube-dwelling worm species from three different families (serpulids, sabellids, and sabellarids). During summer 1999, I am investigating whether snails grow at different rates depending on the worm species they use as a host, and whether they show preference among their hosts. I am also attempting to determine whether parasitism allows a snail access to food particles that the snail could not trap on its own.

The worms, extending their tentacles to suspension feed, do not seem to have any reaction to the presence of the snail parasite. The pseudoproboscis of the snail comes in contact with the worm's feeding tentacles as the snail probes the tentacular crown, trying to locate the ideal point of entry. Those of you with tube-worms in home aquaria know that many species (notably serpulids) are skittish and pull in at the slightest disturbance. Despite contact by the snail, sometimes including sweeping its shell through the worm's tentacles, the worm remains extended. The snails may be invisible to the worm through some sort of "stealth technology" (similar to the clown anemonefish's coating itself in the anemone's own mucus so that the anemone thinks the fish is part of itself). Or perhaps the worm is aware of the snail's presence but is helpless and so tries to feed enough for two. The worms may have a more subtle form of defense, but it is largely ineffective as worms with snails grow much slower than worms without snails.

The evolution of different feeding methods can be studied by quantifying their prevalence and comparative benefits. *T. cancellata* is not an obligate kleptoparasite—it is still capable of independent suspension feeding, and at least some of the snails in the field are not found on worms. Whether any of the snails spend their entire lives without parasitizing has not yet been determined. *T. cancellata* is the only member of its family that has been confirmed as a kleptoparasite, but the unusually long proboscis on all trichotropids makes it likely that other members of this genus also parasitize. Having studied *T. cancellata* intensively in the San Juan Islands, I am expanding my study to include sister species (located in Alaska and Canada) and investigating whether they also steal food. I am also determining whether the frequency of parasitism and use of host species changes throughout the range of *T. cancellata*.

These experiments are some of the first field studies of gastropod suspension feeding, and the first field studies of marine kleptoparasitism. The few studies of kleptoparasitism have mostly been on snails in the same superfamily as *Trichotropis*. None involved observations of the snails in their native habitat; most of these data consist of information gleaned from dredged organisms and laboratory morphological investigations. The *Trichotropis*-worm interaction is an important window to the selection pressures limiting suspension feeders, the challenges faced by ectoparasites and the flexibility of a species to switch between two feeding modes.

This research is part of my Ph.D. thesis at Cornell University. It was made possible in part by a grant from the Conchologists of America last summer (1998). Those funds were of tremendous help in allowing me to afford my research—thank you very much, COA!

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The Old Shell Game

ONE MAN'S TRASH...

by Paul Monfils

Off to our left, the rising sun struggled to clear the crests of the rolling pine-covered hilltops of northern Massachusetts, while inside Jeff's vintage Ford station wagon spirits ran high as we merrily downed the last of our half dozen doughnuts. We had hit the road forty minutes earlier, at 5:30 a.m., in order to reach the collecting site at an optimum time. We weren't worried about catching the low tide—there were no tides at our intended location. But we wanted to get in some serious collecting before the hot midday sun began beating down on us. Or before the shells were towed away. Our car roared up the ramp onto Route 95 North. The prospect of finding so many deep water specimens without ever leaving the shore sounded too good to be true, but I had witnessed Jeff's haul from the previous week and that was incentive enough for me to accept his invitation to accompany him on today's outing.

Two hours later we rolled down the quiet Main Street of the quaint town of Portland, making a right turn onto one of several long piers that jutted out into the frigid north Atlantic. Jeff pulled up in front of a long, low wooden structure covered with weathered brown shingles, typical of beach front buildings in coastal Maine. He went inside to locate the foreman and secure final approval for our excursion onto private property. I couldn't help noticing that the odor filling the cool morning air was curiously pungent, even for a fishing harbor at low tide. "We're in luck," Jeff reported, "they're just about to begin." We donned our rubber boots and gloves and our broad-brimmed hats. Then I followed him around to the back of the building.

There it was, just as he had described it—a massive gray steel box, forty feet long and ten feet wide, with sides a bit higher than my own six feet. We tossed our bushel baskets and rakes over the wall, then clambered up and over. The dumpster was already half filled with shells. Scallopers in more southern locations clean their catches at sea, returning the empty shells to the ocean floor. But here the scallops were delivered live to the scallop shucking plant. Inside, the meat was removed and packaged, while the shells—and anything else the trawl had snared—exited the plant on a moving conveyor belt, finally coming to rest in the huge dumpster where we now stood. I gazed around me. It was a shell collector's dream. Among several tons of sea scallop shells (*Placopecten magellanicus*), I could see colorful Iceland scallops (*Chlamys islandica*); New England Neptuneans (*Neptunea decemcostata*); Northern Whelks (*Buccinum undatum*); Stimpson's Colus (*Colus stimpsoni*); American Pelican's Foot (*Aporrhais occidentalis*); and fist-size Northern Moon Snails (*Lunatia heros*).

I gazed around me again. It was a shell collector's nightmare. We walked gingerly on a shifting, slimy mass of shells, lubricated with decaying remnants of molluscan flesh. Clouds of buzzing flies filled the air, while writhing masses of their pallid, pudgy progeny munched their way through the putrescent pile. The stench was potent and pervasive, even to a nose which my spouse has fondly described as "strictly decorative." But...at my feet lay a two-inch Greenland wentletrap (*Epitonium greenlandicum*)! Sometimes a collector just has to do what a collector has to do!

We began gathering shells in earnest, most with their opercula lying loosely in their apertures, the soft parts within having been summarily consumed. It was one of the most exciting, interesting and disgusting conchological experiences of my life. Suddenly, with an irreg-

ular clatter and clanking of well seasoned machinery, the wide motorized belt overhanging one end of the enclosure came to life. A few uneventful minutes passed, and then it started raining—shells! From the end of the moving belt poured a continuous wave of deep water molluscs and other marine creatures. Ninety-eight percent of it was sea scallops—but OH! That two percent! Neptuneans and other whelks tumbled down the sides of the ever-increasing pile of shucked sea scallop shells (try saying that three times fast!). Baird's Top Shell (*Calliostoma bairdi*), one of the few really colorful cold water gastropods, Boreal Hairy Shells (*Trichotropis borealis*) and Stimpson's Tusk Shell (*Dentalium entale stimpsoni*) made an occasional appearance. We reached in with our rakes, frantically trying, often unsuccessfully, to save specimens before they were buried in the onslaught. Cup and Saucer Limpets (*Crucibulum striatum*) and red chitons (*Ischnochiton ruber* and *Tonicella marmorea*) clung to the outer surface of some scallops. A number of small bivalves frequently appeared, including *Nucula proxima*, *Nuculana pernula*, *Cyclocardia borealis*, *Astarte castanea*, *Astarte undata*, and *Hiatella arctica*. Strange deep water starfishes (*Henricia*, *Pentagonaster* and *Hippasteria*) tumbled off the conveyor every few minutes.

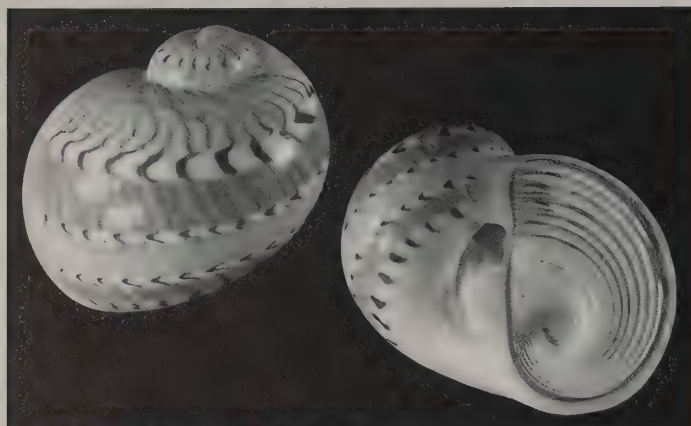
A whitish whelk with encircling raised ribs bounced down the side of the pile and came to rest at my feet—a long-dead Neptune, I supposed. I pushed it aside with my foot, but as it rolled ventral side up, I caught a fleeting glimpse of an operculum being rapidly withdrawn into the shell. I retrieved the specimen, examined it curiously. There was some mud and algal growth on its surface, but it was very much alive. Jeff interrupted my ruminations—"Hey, have you ever seen anything like this?" In his outstretched hand lay a *Neptunea decemcostata*, cleaner than mine and white as snow from the tip of its siphon to its perfect apex. My specimen too, once cleaned, would prove to be a pure white albino. Of the sixty or so *Neptunea* we found that day, seven proved to be albinistic, a phenomenally high incidence of an extremely rare condition. All the albinos came off the conveyor within a period of 45 minutes, presumably while the plant was processing the catch of a single vessel, which had apparently dredged a localized population in which albinism was unusually common. Jeff later sent a specimen to Dr. R. Tucker Abbott, who wrote back saying he had heard reports of albinistic *Neptunea decemcostata*, but had never seen one, and had assumed the reports were based on old, sun-bleached specimens—but that now he was convinced.

We returned home that day with more than a bushel apiece of trawled deep water shells. Someone once said "one man's trash is another man's treasure." We had put the old adage to the test, and proven it valid! Granted, the specimens did not have exact locality data. Granted, the experience was not entirely pleasant. Granted, my wife made me undress on the porch and leave my clothes outdoors. But the satisfaction in having found so many difficult-to-obtain shells far outweighed any inconvenience involved in the process, and I heartily recommend this collecting method to anyone fortunate enough to live within ready driving distance of such a facility.

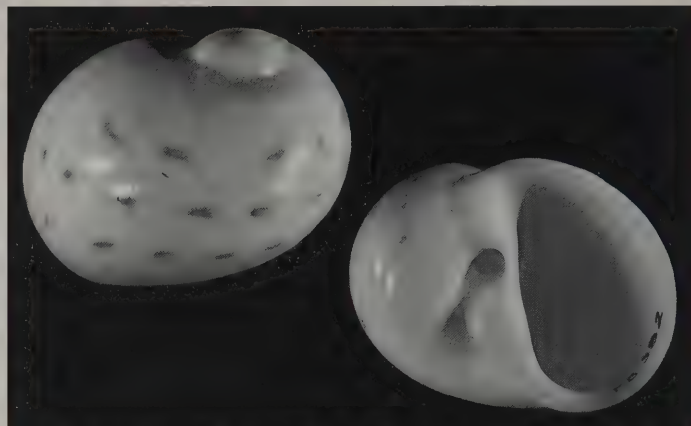
A month later we visited the site again, but arrived just as a truck was hauling the dumpster away. We gave chase—but not too closely, in order to avoid the scallop shells which flew out of the open dumpster with every bump in the road or gust of wind. The final destination was a large farm, forty miles inland, where the shells would be plowed into the soil, as a sort of combination lime and fertilizer. The truck dumped its load in the middle of a large field. We approached the farmer, who gave us permission—and strange looks—and we went shell collecting!

WESTERN ATLANTIC NATICINAE

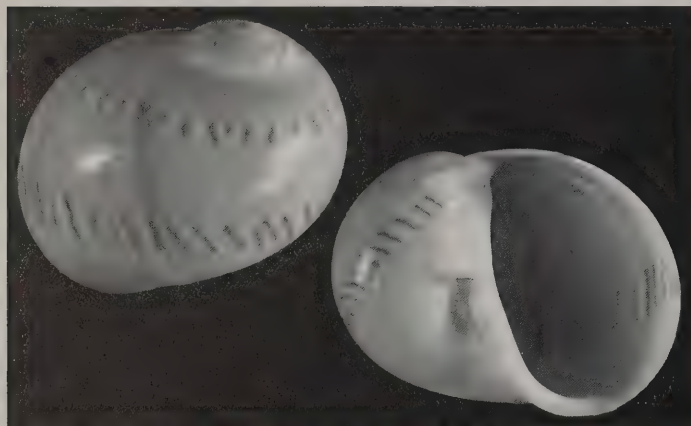
by Kevan and Linda Sunderland



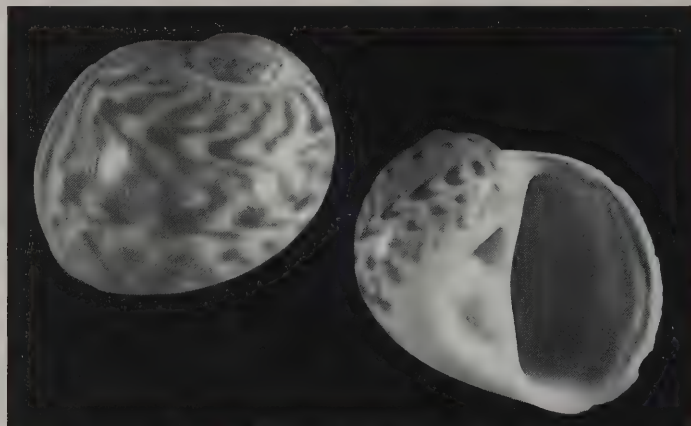
Natica canrena (Linné, 1758). 67 mm. 14 m, diver, Porto Francis, Venezuela.



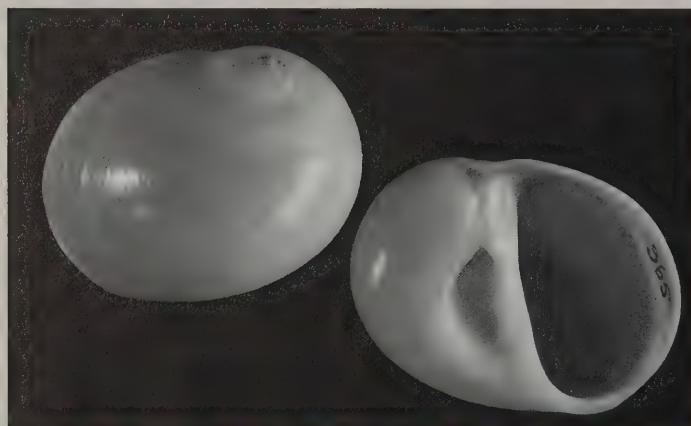
Natica c.f. canrena. 36 mm. 130' by diver, West End, Grand Bahama.



Natica castrensis Dall, 1889. 28 mm. 500', dredged off St James, Barbados. Ex. Finn Sander Collection.



Natica cayenensis Recluz, 1850. 26 mm. 139', shrimp, off Key West, Florida.



Natica guesti Harasewych and Jensen, 1984. 38 mm. 500', dredged off St. James, Barbados. Ex. Finn Sander collection

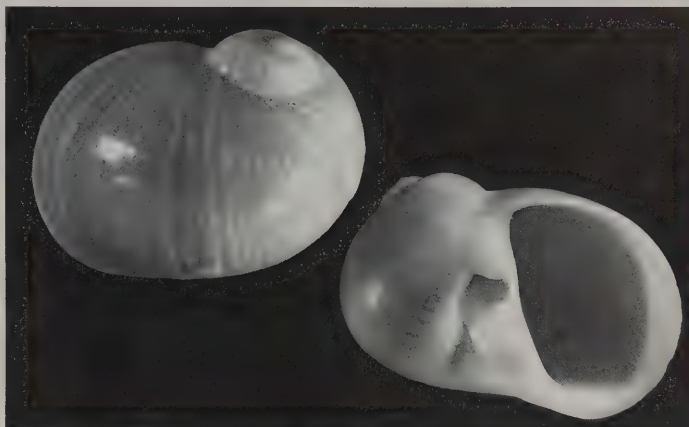


Natica livida Pfeiffer, 1840. 17 mm. Snorkel, 3' in sand, Green Turtle Cay, Abaco, Bahamas.

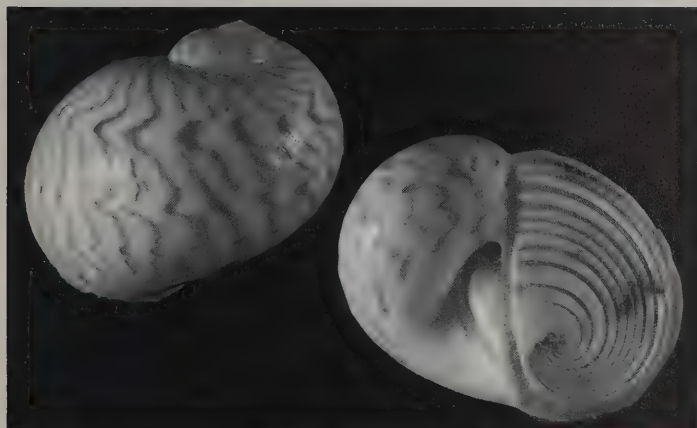
The intent of this feature is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



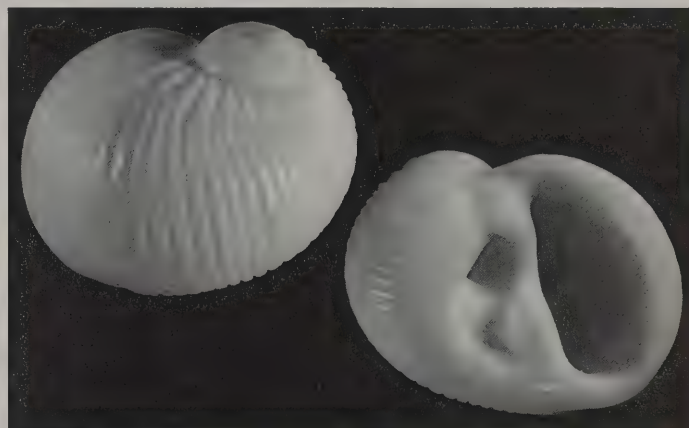
Natica tedbayeri Rehder, 1986. 29 mm. 40', diver, Pickles Reef, Key Largo, Florida.



Natica verae Rehder, 1947. 35 mm. 3' in grass and sand, Marco Island, Florida.



Natica species. 41 mm. 225', shrimp, off Contoy, Yucatan, Mexico.



Stigmaulax sulcatus (Born, 1778). 23 mm. 80', diver, off Dania Beach, Florida.



Stigmaulax cancellatus (Hermann, 1781). 26 mm. 80', diver, off Dania Beach, Florida.

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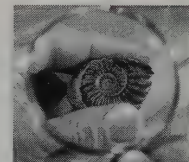
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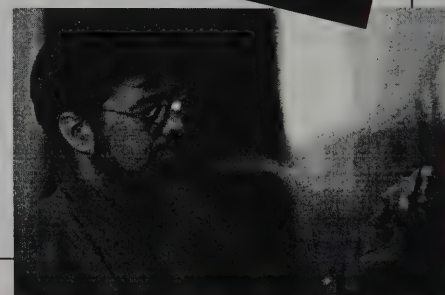
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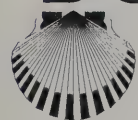
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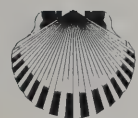
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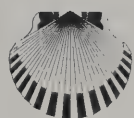
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BRAZILIAN SHELL MUSEUMS

by José Coltro

Last September I had the opportunity to visit our Museu Nacional (National Museum) in Rio de Janeiro. It was my first time there and I had a nice surprise. I had an appointment with Dr. Norma Salgado, the Mollusk curator and today the top expert in Brazilian land shells. A visit to the museum building itself is a great experience. The museum is in the old Emperor's Residence (Brasil was a monarchy between 1822 and 1889) in a beautiful park called Quinta da Boa Vista. Our second Emperor, Pedro II, was science lover with an incredible collection of everything you can imagine; part of this collection is on display in the museum. The building, undergoing renovation these past few years, will soon be ready. It is possible to see the very large mollusk collection with an appointment. Right now there is some interesting research going on there, especially research into the terrestrial fauna from the Amazonian region and into deep-water shells from the central Brazilian coast.

I went to the museum to give to Dr. Salgado some live shells of the Bulimulidae family—she is working on the revision of that family in Brasil. I had found some information about the genus *Thaumastus*. I also had the opportunity to meet Dr. Arnaldo Coelho, the former Curator of Mollusks and Museum Director. He retired a few years ago but he is still working there, especially in helping the new malacologists. Dr. Coelho has authored some very important papers about the Brazilian fauna, but his greatest achievement has been the museum collection and the stimulation of interest in Malacology among Brazilian biologists. Many of today's Brazilian malacologists had his help in beginning their studies in this field.

Another great shell museum is the Museu de Zoologia da Universidade de São Paulo (Zoological Museum of University of São Paulo) with 30,000 lots. This museum was started by von Ihering at the end of the last century and it was the source of some of the most important research done in our country. The museum has the best Brazilian land shell collection, and boasts a good scientific group in Dr. José L. Leme (as the Curator of Mollusks), M.Sc. Luiz R. de Simone and M.Sc. Paulino Souza. The collection is right now being moved to new cabinets. This museum has the largest type collection in our country and one of the best mollusk libraries, containing most of the rare and important books. The main research in this museum is mollusk anatomy; Mr. Simone is really good at that. Dr. Leme is taking care of the new cabinets and Mr. Souza is finishing his revision of Marginellidae. The museum has other associates like M.Sc. Claudio Mantovani, a fresh-water specialist.

Another interesting shell museum is the Museu de Juiz de Fora, in Minas Gerais State. The museum was created in the 50's based on a collection made by Dr. Maury Pinto de Oliveira. Dr. Oliveira continues today as head of the museum. He has helped many malacologists during his almost 50 years of service. The shell collection can be visited by appointment. Dr. Oliveira is now finishing a new book, *Land Shells from Brazil*, which will be ready next January 2000.

Finally, our best marine shell museum is the creation of one of the most incredible men: Professor Eliezer de Carvalho Rios. Professor Rios had the opportunity to build one of the best shell museums in the world. The Museu Oceanográfico de Rio Grande has the largest collection in Latin America with over 40,000 lots of shells. Members of the University of Rio Grande with Professor Rios as head created the museum in the 50's. In the following years Prof. Rios built an extensive collection in marine mollusks and now the museum boasts one of the best exhibits we have ever seen. Today Professor Rios is retired (but still going to the museum every week) and Professor Lauro Barcellos is the new director. He has the help of Dr. Iara Swoboda Calvo and of the new generations of malacologists who will continue to build and improve this great museum.

THE BERLIN SHELL SHOW

by Marcus Coltro

The first Berlin Shell Show was held at the Marriott Hotel in Kopenick, a district of Berlin, October 23 and 24. Many shell dealers and shell collectors participated in this first shell show in the former East Germany. Dr. Felix Lorenz was the organizer and everything went very well. The hotel is quite nice and the rates were very good. The shell display room is big and very well lighted. It was also a great opportunity to visit the new German capital city, Berlin. The city is being totally restored and one can see new buildings going up everywhere in the downtown area. We were able to visit some of the many museums in the city, something most of the shell show visitors did after the show concluded. Next year the show will be at the same spot and we hope to participate again! You can see some pictures of the Berlin Shell Show at this website: <http://www.geocities.com/Paris/Lights/6359/berlinshow/berlinshow.html>

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The Sexual Behavior of Mollusks, Land—Freshwater—Marine

by Beatrice E. Winner. 1999. Published by E.B.M., P.O. Box 14923, North Palm Beach, FL 33408-5328. 124 + v pages. 7" x 8.5" spiral bound. \$19.00 + \$3.00 p/h

Bea Winner, author of several earlier books on the spawn of mollusks, has taken her inquiries into the reproductive life histories of mollusks a step backward behaviorally with her newest offering. This one is a different kind of book, approaching the subject of the sex life of mollusks anecdotally and with humor. As she tells us herself, in some self-advertising inside the front cover, "The book contains amusing information regarding the quaint sexual behavior and courtship of mollusks. The most unusual encounters are mentioned. It is fascinating and informative."

For a slim volume, Bea's labor of love boasts a sizeable bibliography of 8 pages, important because her material is all drawn from technical publications, enlivened by Bea's retelling and her humorous cartoons, as well as by illustrations from the literature. A handy little glossary and an index complete the book.

This reader has two criticisms: the wish that more proofreading had been done and that Ms. Winner had given us more documentation. In-text references or footnotes would have been helpful in determining, for those of us who want to know more, just where among that impressive list of references she found her pieces of information.

The reproductive behaviors of over 150 species are included, in accounts that range from brief summaries to the lavish detail of popular fiction. Organized primarily by habitat (land, freshwater, marine) and, to an extent, taxonomically, these accounts are as extensive and/or graphic as Bea could make them, depending upon the thoroughness of her various sources. They are, in any case, a treasurehouse of fascinating facts about the chosen species.

Did you know that the little oyster drill *Eupleura caudata* is extremely promiscuous, copulating up to 48 hours at a time, and favors multiple partners and orgies! And that *Strombus pugilis* males guard a female they have mated with against other males. Did you know that male gastropods bear their penises on their heads? Hmm. Whereas male chitons have no copulatory organs at all. Did you know that the mate of the 8" female *Argonauta argo* is just 1/2" when full grown, and that he often lives inside the female's mantle cavity or inside her relatively huge shell? Did you know that the Spiny Cup and Saucer, *Crucibulum spinosum*, and the various species of slipper shells begin life as males and eventually change into females. Isolation from a female will terminate the male phase. Well enough of the tattling. If you want to read more, you'll have to treat yourself to Bea's book!

—LMS

Remembering Constance E. Boone

by Lucy Clampit

Constance E. Boone was born December 3, 1917 in Runge, Texas. She graduated from the University of Texas with a degree in Journalism and worked as a newspaperwoman for a number of years. One day in the early 60's, a son came home from school and informed her that he needed to make a collection for a class project. They decided on a shell collection, and Connie's lifelong passion for malacology began.

She was a founding member of the Houston Conchology Society. During most of her years of membership, she served as editor or co-editor of the club's publication, the *Texas Conchologist*. From 1996 to 1999 she was the club's president. She shared her vast knowledge with club members, but she also encouraged them to read and learn more about the shells that they collected.

For many years Connie worked as a volunteer in the Malacology Department of the Houston Museum of Natural Science. Even though she had no formal training in malacology, she worked with Dr. T. E. Pulley, Curator of Malacology at the Museum, and learned from him. After his death, she was named Curator and held that position until her retirement in 1995. After retirement, she continued to work with the Museum's collection and with new Curator Dr. John Wise. She was very involved in the Northwest Gulf of Mexico Survey that the Museum sponsored in the late 60's. She cataloged thousands of lots of shells, secured major donations for the Museum and directed the first installation of the Strake Hall of Malacology.

Connie was very active in AMU (now AMS). For many years she served as secretary and was instrumental in helping the organization survive some troubled times. In 1994 she served as president and hosted the annual meeting in Houston.

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Perhaps it was because of her Journalism training that Connie was always curious, asking questions and learning. Through the years, she traveled to many parts of the world to collect and learn about shells. Just before her 80th birthday, she and Dr. Jerry Harasewych went down in a submersible to collect *Pleurotomaria* for her beloved museum. Her work and research resulted in several mollusk species being named for her.



Malacology was a major part of Connie's life, but she was also a sports fan. Tennis was her favorite, but one had to be careful about phoning during any "big" game. She was also an avid reader, and loved adventure stories. Just a few years ago, she took a best selling novelist to task for locating a cone shell in the wrong country.

In September she went on a shelling trip to Australia. On Sept. 14, 1999, while she was in Broome, a blood clot took her life. Her ashes are sprinkled on an Australian beach. We can best honor her by being curious and continuing to learn about those intriguing mollusks. To encourage that, a Constance E. Boone Memorial Fund is being set up at the Houston Museum of Natural Science. It will provide funds for researchers to study the Museum collection. Donations to the fund may be sent to the Houston Museum of Natural Science, One Hermann Circle Drive, Houston, TX 77030.

A plaque honoring Connie Boone was unveiled at a special ceremony at the Strake Hall Of Malacology at the Houston Museum of Natural Science on Nov. 19. Few amateurs make the contribution to science that Connie Boone made. Malacology and Conchology will miss her.

To Oil or Not to Oil; Ay, There's the Rub

by Charlie Sturm, Jr.

The question as to whether to "oil" shells or not is an interesting one. I recently posted a similar question to NHCOLL-L (the Natural History Collections discussion group). Museums, judging from a limited response to my inquiry, do not treat shells. They generally accept them as they are, store them *au naturel*, and depend on storage conditions to preserve the periostracum. The main storage conditions of concern are temperature and relative humidity. There is one major museum that I know of that does treat their Unionid collection with a preservative. After the shells are cleaned, they are dipped into a mixture of paraffin and xylene. The xylene evaporates and the process results in a shell that is impregnated with paraffin. An alternative is to treat some but not all.

It is of concern to a curator or a collection manager what has been done to a specimen in his care. If a specimen in a museum is glued, "oiled" or treated in any other manner it is important for that treatment to be documented. A shell that has been oiled will no longer be useful for certain types of biochemical studies. Occasionally, shells are requested from the Carnegie Museum for "destructive testing." Perhaps a researcher wants to compare current shell chemistry to what was present 100 years ago. An oiled shell would be useless for this project because of the possible contaminants that may have been intro-

duced via the oil. To prevent someone from using an altered shell and thus obtaining erroneous data, museums take great pains to document what is done to the specimens in their care. This is not to say someone should not oil or alter a shell. It does suggest that one document what has been done to a shell and that this documentation accompany the specimen. This way anyone in the future knows the "history" of the specimen.

Lighter fluid, which is generally recommended as the vehicle for mineral oil or silicon oil, is a form of naphtha. In the United States it is often called VMP Naphtha (varnish maker and painter's naphtha) and is readily available in hardware stores. This is a mixture of small chain hydrocarbons that are used as organic solvents. It helps the oil penetrate into the surface of the shell and then evaporate. It should be used in a well-ventilated area, away from any risk of flame or sparking. The rare times when I used this technique I did it under a fume hood (when done in a lab) or outdoors in my backyard (when done at home).

I would like to point out that the shells you own are yours to do with as you like. However, if you foresee donating them to a museum, or if you just want to practice good curatorial technique, please document what you do to a shell and keep that information with the shell. Keeping these types of records in a file somewhere else is unacceptable. The risk of the specimens and the records being separated and vital data being lost is too great (and yes it does happen but that is another story). Remember, even oiled shells will be of use to museums for displays, study collections, education, etc.

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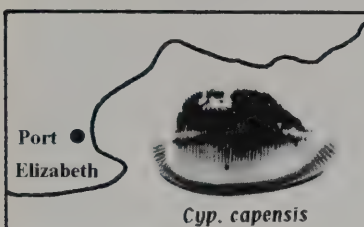
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LAND SNAILS IN THE PHILIPPINE ISLANDS, VIETNAM, AND HONG KONG

by "Henry A. Martens"

My first visit to the Philippines was an all-expense trip courtesy of the U. S. Army Air Force. During 1946 and 1947, I visited the Manila area (where I was stationed), Lake Taal, and the delightful cool-climate of Bagio in northern Luzon. This time, 54 years later, we visited the islands of Cebu and Bohol in the central Philippines and then Vietnam and Hong Kong. We flew directly from Hong Kong to Cebu City, thus bypassing Manila. This time around I was on a shelling trip and I was the only terrestrial collector. When the others went to the beach, I went inland.

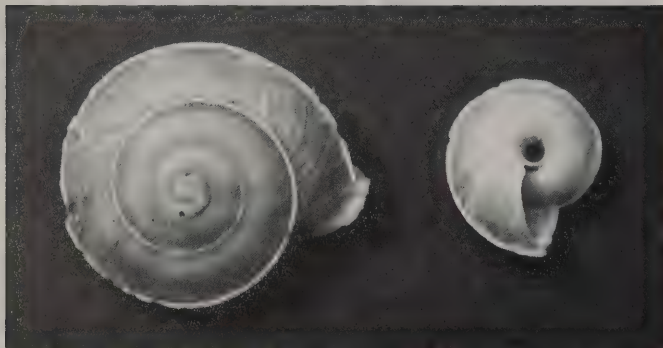
Before I go on a trip, I compile a faunal list based on the literature. In the case of the Philippines I started with the 1930 paper of Faustano,

and updated it with more current literature. Vietnam, with no published list, was more difficult, but by searching the literature I did compile a species list. Hong Kong is easy because Brandt published a list in 1980. Identifying specimens can have its problems, but having a compiled species list makes identification much easier. Not simple, but easier. I look at the possible species and through elimination find a description that fits my specimen.

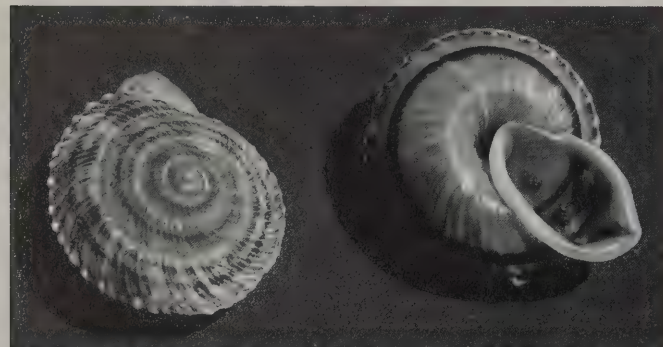
In the Philippines, arrangements had been made to provide me with a car and driver. This was convenient because we could stop whenever a potential collecting site was encountered.

CEBU

The island of Cebu is long and narrow (140 by 20 miles) with a north-south spine of limestone mountains, broad limestone terraces along the eastern coast and a narrower terrace on the west coast. The original forest, if there ever was one, has long since been removed. We stayed at the Tambuli Beach Villa on Mactan Island, just east of Cebu City.



Obba parmula is very flat with an angular periphery — Cebu: Kawasan Falls. 34 mm



The serrated periphery of *Obba rota* is attractive — Bojol: Obuhan. 30 mm.



In the *Obba moricandi* growth series the reflexed lip develops with adulthood — Bohol: Roxas Park. 32 mm



Amphidromus species: Top: *A. cambojiensis* (62 mm) from Ba Ho, Viet Nam; *A. dohrni* sinistral specimens with radial dark stripe on color pattern, Viet Nam; *A. dohrni* dextral and sinistral (60 mm) specimens with radial dark stripe, Viet Nam.



The winner! *Obba moricandi* crossing the finish line — Bohol: Roxas Park. 32 mm

Collecting localities were hard to find. There is little forest remaining and rice paddies are everywhere. Even the road cuts have cultivated field above them. The use of small marine shells as fertilizer in the fields produces marine float material on the slopes. Getting to the localities south of Cebu City required an hour to transverse the city. The most beautiful and productive area was at Kawasan Falls a short distance south of Badian on the west coast. From the trailhead it was a fifteen minute walk on a very well maintained trail through small villages along the river to the falls. The river is, according to a sign, "The purest water in the Philippines." It is crystal clear with a tinge of blue. I've seen many waterfalls around the world and while these falls were not the highest nor had they the most water, they were in a spectacular storybook setting. The 20-30 foot falls have one main fall over the limestone cliff with a couple of smaller falls on either side which appear to be coming out of the cliff. The vegetation is tropical and the few rattan and bamboo buildings reminded me of a scene from *Swiss Family Robinson*. The snails consisted of *Lagochilus guimarasensis transitans*, *Obba parvula*, *Chloraea fibula*, and some still to be identified.

BOHOL

The forty-five-mile diameter circular island of Bohol is east of Cebu. We stayed at the Bohol Beach Club on Pangloa Island located off the southwest coast adjacent to the capital of Tagbilaran City. Bohol is less crowded with 1/3 the population of Cebu, and is more wooded. The southern and central part is wooded and more elevated than the lowlands to the north.

Our first Bohol day was a scenic tour to the Chocolate Hills in the center of the island. The limestone island has wooded erosion remnants rising above the rice paddies. These are the Chocolate Hills. The only snail I saw was the introduced *Achatina fulica* at the Chocolate Hills Overlook.



Cyclophorus validus — Bohol: "Planted Forest." 31 mm

My first collecting excursion was to the "Planted-Forest" south of the Chocolate Hills. The 2118 acre (3.3 square miles) forest was planted with native species in 1958. The first thing I saw stepping from the car was a large *Helicostyla* shell occupied by a land crab. They both were collected and the ownership of the shell was decided later. The collecting area was a hundred yards square with many eight to twelve inch diameter trees but without a shrub understory. It was the flat flood plain at the junction of two canyons, and with no leaf cover shells were visible everywhere on the open ground. I collected three sandwich bags full and Jimmy, my guide, also collected three bags. It is the best and the easiest land snail collecting I'd seen, probably the accumulation of several seasons.

It must have been millipede mating season because there were half inch diameter and eight to ten inches long millipedes everywhere. Jimmy warned me that his mother said, "If you get millipede blood on you, you will go blind." Since it was a "my mother said" warning, I didn't step on any millipedes which was not easy. I can understand the warning. Millipedes protect themselves by emitting cyanide gas. The cyanide generated by such large critters may be harmful if they are handled, especially near the eyes.



A midden of broken *Cyclophorus validus* shells — Bohol: "Planted Forest."

The shells collected were *Helicostyla camelopardalis boholensis*, *Cyclophorus validus*, *Cyclotus caroli*, *Amphidromus maculiferus multicolor*, *Leptopoma perlucidum*, *Euplecta boholensis*, *Chloraea samboanga*, *Obba rota*, *Obba moricandi*, and a few *Achatina fulica*. The live *Euplecta*, *Obba*, and *Cyclotus* were on trees. The live *Cyclophorus* were on the ground. *Obba rota* has a very attractive shell, about an inch in diameter and a quarter inch high, with many dark narrow spiral bands; the radial ribs which project slightly beyond the periphery of the shell produce a saw-tooth shell edge. As if this were not attractive enough, the aperture pulls away and separates from the columella. The lip is flared and the aperture points downward, a remarkable combination of features. There are several *Obba rota* subspecies, seemingly one for each locality where it occurs. When walking through the forest a quarter of a mile from the road, I came upon a midden of broken *Cyclophorus validus* shells in an area a foot square. It was strange to see the heavy shells so broken and I couldn't visualize birds doing it. Could it be a mammal? It was too remote for human consumption. This is another snail mystery.

We took a ride via Loay and Loboc to Bilar in the center of the island. At Bilar we turned right and went to the little village of Riverside. A woman wading in the stream collected *Melanoides tuberculata*, *Pila polita*, and the clam *Corbicula* from the Bilar River. We

continued on a dirt road to the entrance to Rajah Sikatuna National Park. My driver left me there at 10 a.m. and picked me up at 1:30. The park is an older forest with well maintained trails on the slopes above the rice terraces. Snail shells were everywhere. The dominant snail species of the "Planted-Forest" were the minor species here. The park's dominant species were *Cyclophorus validus* and the large *Amphidromus maculiferus multicolor*. Would a slight elevation of 260 meters be sufficient for the species difference, or is it the habitat?

The next day we drove west along the south coast through coastal villages to Garcia Hernandez, then north a short distance to Roxas Park. Collecting along the road among limestone boulders yielded snails but not much variety. The striped *Obba moricandi* which was rare at the other localities was the dominant species in association with the sparingly found elongate *Helicostyla camelopardalis boholensis*.

After leaving Garcia Hernandez we continued east along the coast to Jagna where we headed north on a dirt road toward Sierra Bullones. After a few miles the road worsened and we turned around. The terrain was denuded, with only isolated coconut palms. Returning to Jagna we continued east to Nauca Point. There were limestone outcrops but there was also a lot of cultivation. The striped *Obba moricandi* was on the smooth trunk of the coconut palm at a height of less than 7 feet. The shell is 31.5 mm wide and 17 mm tall, with a single spiral band above and below the periphery, a smooth shell surface and round periphery, and with the typical *Obba* aperture. The *Euplecta boholensis* were on rocks or rough barked trees.

In the Philippines the shell dealers use Abbott and Springsteen & Leobrera to identify their landsnail specimens. This results in some

"new localities" when specimens are misidentified. In other cases localities were changed to conform to the locality where the "species" was reported in the references. This would result in the loss of range extensions.

VIETNAM

We were greeted by our tour leader who was a shell dealer. During one of our days in Ho Chi Minh City, we went south to Mytho City on the tidal Mekong River which originates in China and is about 2,600 miles long. On the delta we visited Unicorn Island (Thoi Son) where I saw some *Neritina* on the tidal vegetation.

On another day in Ho Chi Minh City we drove to Long Hai on the coast southeast of the city. North of the village are low, long granite hills with scant vegetation and many outcrops. We went up a small shrubby slope for an hour to check the outcrops. While avoiding many spiny plants, I collected *Amphidromus dohrni*, *Naninia aulicus*, and *Elaphroconcha hageni*, and near the road I saw *Achatina fulica*.

I only had one full collecting day at Nha Trang, a coastal city two hundred miles northeast of Ho Chi Minh City, but it was a good one! For my collecting transportation our leader proposed using a motorcycle with me riding double. I thought this was definitely not a good idea. A rental car was too expensive so we used a taxi. I left the resort at 8 a.m. with our leader's son-in-law in a taxi to go collecting. The rest of the group were going to the islands for snorkeling. My guide, who collects for our trip leader, spoke a little English but had been given a paper with Vietnamese and English phrases. Examples were, "Don't go any farther, there are many snakes" or "Do you want to rest?"



Amphidromus metabletus pachycheilus forms from Vietnam – Left to right, top to bottom: *A. m. p. confluens* dextral (40 mm) and sinistral (44 mm) specimens; *A. m. p. tritaeniata* dextral and sinistral specimens (largest is 40.7 mm); *A. m. p. flava* dextral and sinistral specimens (44 mm) (ref 5385-05); *A. m. p. interrupta* (46 mm); *A. m. p. trizona* (42 mm) dextral and sinistral (42 mm); *A. m. p. alba* (largest specimen is 41 mm) dextral and sinistral growth series from Cat Lo.



Chloraea samboanga has a very fragile shell — Bohol: "Planted Forest." 31 mm

Our first stop was along the road at the beginning of Cat Loi village. On the property of our guide's friend, we collected the endemic *Amphidromus metabletus* and its varieties everywhere but especially on the three-sided cactus growing along the road. Abbott's *Compendium of Land Shells* indicated it as "Extinct?" It is surely not extinct. The local dealers (this is probably where Abbott got his information) use "extinct" for "endemic". When questioned on this, I was told, "It is extinct everywhere else."

The amphidromorphic *Amphidromus metabletus* was common. Its color variations have been named. There are three subspecies of *A. metabletus*: *A. metabletus*, *A. pachycheilus*, and *A. insularis*. Subspecies *A. metabletus* is only found at the type locality (Mother and Child Mountain). The subspecies *A. m. insularis* is from Bai-Min Island near Nha-Trang and is believed to be a dwarf of subspecies *A. m. pachycheilus*. Subspecies *A. m. pachycheilus* has several "color phases" which frequently occur together. These are:

entire shell white — *alba*

white background with wide brown bands — *confluens*

white background with three brown bands — *trizona*

white background with brown interrupted bands or dots — *interrupta*

entire shell yellow — *flava*

yellow background with three brown bands — *tritaeniata*

entire shell brown with a white sutural line — *fusca*

At the Cat Loi locality I collected "color phases" *alba*, *flava*, and *tritaeniata*.

Our next stop was near Ruri village at an orchard near a small drainage channel. With no water in the channel we saw no live oper-



Live *Naninia aulicus* on a leaf. The empty shell is much lighter in color — Viet Nam

culates but found many dead ones. My guide was very careful about snakes. We did find two shed skins, so snakes were present, but I don't know what kind of snakes shed the skins. The *Cyclophorus consociatus* with a red lip and *Elaphroconcha hageni* were dead on the ground but live specimens were low down (less than two feet above the ground) on the trees.

We made a couple more quick stops and decided to have lunch. Our restaurant was a small structure built over salt water ponds full of sea creatures. The meal, which they ordered, consisted of a very tasty rice based fish soup with small shrimp. Because the soup was 30 cents a bowl, I treated!

After lunch we turned off the paved road and headed up a broad valley toward hills covered with shrubs and a few trees. Our destination was Ba Ho Recreation Area which has a stream and wide trail or road. We collected in the wash area of the stream. With the aid of "helpers" we found some interesting things. The "catch of the day" consisted of *Amphidromus cambojiensis*, *Camaena chabensis*, *Cyclophorus consociatus*, and *Elaphroconcha hageni*. At this site there was a bulimulid species resembling those from the Caribbean. I was surprised to find it, even more so when I saw it was sinistral! Was it abnormal growth? When I found three more, I realized it was undoubtedly a sinistral species. After much literature searching, I found a match with the bradybaenid *Pseudobulimius siamensis* which has been reported from the Nha Trang area.



Live *Amphidromus metabletus pachycheilus tritaeniata* on a leaf — Viet Nam: Ba Ho. 41 mm

We made another brief stop in an orchard where *Cyclophorus consociatus* and *Amphidromus metabletus pachycheilus tritaeniata* were found. We returned to the hotel at 4 p.m. A great collecting day.

HONG KONG

Our final stop was Hong Kong. I'd been there before and headed for Victoria Peak. Imagine my surprise when I discovered all the roadside slopes had been coated with concrete to reduce soil erosion. Snails were present under the trees in the few non-concreted areas. The most spectacular species is the 40 mm sinistral multi-striped *Camaena cica-tricosa*. I also collected *Cyclophorus punctatus* and *Helixarion imperator*.

I visited one of the satellite islands, Cheung Chan, but it was quite developed and I found only *Bradybaena similaris* and *Achatina fulica*.

SUMMARY

Bohol and Vietnam had much better collecting than the degraded landscape of Cebu and the cemented sites in Hong Kong.

A list of the Philippine's rich fauna was compiled in 1930. Much

(Continued on bottom of next page)

CONE WARS

by Don E. Barclay

The following article appeared as a series of episodes or "rounds" last April and May on COA's listserver, Conch-L. While the information it uncovers is likely already known to science, Don's engaging style and humorous approach to the subject of Conus predation make his accounts vivid and memorable, and not always what one would expect.

Don named his cones and cowries for well known members of Conch-L, as much to keep track of them as to add interest. But giving them human names made them seem to have human motives and emotions, and had the subscribers rooting emphatically for the survival of this cowry or that cone. We hope the readers of American Conchologist enjoy the "epic" as much as the readers of Conch-L.

I finally got the aquarium set up, and have been catching fish for it for the past three days. I went out to catch some cones this afternoon, and caught most of the ones I was hunting.

I now have one *Conus textile*, about 80mm ("Art"), one *Conus magnificus*, 70mm ("Eduardo"), one *Conus episcopatus*, about 65mm ("Tom"), another *Conus episcopatus* about 55mm ("Mark"), and a *Conus canonicus*, 50mm ("Ross"). I still plan to put a *Conus omaria* or two in the tank, and a couple of *Bandanus* cones (*Conus bandanus*). I'll have to make a trip to get a nice sized *Conus marmoreus* for my experiment: I don't think a 30mm *Conus bandanus* is a fair fight against an 80mm *Conus textile*.

To keep the guys from becoming unnecessarily cannibalistic, I also caught some cowries today, all but one of which are now crawling circles around the tank. I collected one *Cypraea talpa*, one *Cypraea lynx*, four *Cypraea caurica*, one *Cypraea erosa*, and four *Cypraea arabica*, plus a handful of *annulus* and *moneta* cowries. I caught a few other cones too (*Conus catus*, *Conus sanguinolentus*, *Conus capitaneus*) but decided not to include them in the equation.

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(Continued from previous page)

has changed since then, including the landsnail fauna. Being in the Philippines for only two weeks, I collected the conspicuous species. In Cebu I collected at twenty-seven localities from the ends of the island, along both coasts, and along the transit roads. I collected at twenty-six



Camaena cicatricosa is a colorful 40 mm sinistral shell — Hong Kong: Victoria Peak

I didn't even get all the animals in the aquarium before I saw something I'd never seen before. In my collecting bottle, my shy *Conus magnificus*, Eduardo, snaked out his proboscis and stung one of the *Cypraea caurica*! And he did this while he was fully retracted into his shell. He didn't eat the cowry, as I was in the process of moving them into the aquarium. I dumped Eduardo's victim into the tank anyway, just to see what would happen. The *Cypraea caurica* partially retracted into his shell, but it almost looked like he wouldn't fit. He proceeded to autotomize about the posterior 25% of his foot! I've seen harps do this, as well as several species of nudibranchs, but never cowries. He then remained on the bottom of the tank, motionless, for the next two hours. I bought lobsters for dinner, removed the tails, and then fabricated a little scoop to get the dead cowry out of the tank, but when I went in to remove him, he wasn't where I had left him. In fact, he had crawled to the top of the tank. It wasn't hard to tell which one he was, as only one of the cowries was missing a quarter of his foot.

Cone Wars — Round 2

I waited a couple of days to post the initial results of the cone experiment on Conch-L because I wasn't sure exactly how some of the



Eduardo Magnificus on the prowl.

localities in the southern (mountainous) region of Bohol extending from Baclayor, Corella, and Antequera in the west to Garcia Hernandez and Canopao Point in the east.

My collecting in Vietnam was only the one day at Nha Trang where the collecting was excellent. I would like to return to Vietnam with more time and visit a variety of habitats.

LESSONS

Landsnail collecting has its advantages. The Philippine shell dealers have specimen marine shells and bags of land snails. The price was many dollars for marine and a few cents for land. I did learn two things:

1) The "rule" of Philippine driving is; "Never allow a car to be in front of you." If a car is a quarter of a mile ahead of you, you HAVE to catch and PASS it. This "rule" creates thrilling experiences.

2) The Philippine concern for education. Written on the wall of the schools is; "Be proud you are a teacher. The future depends on you."

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situations had turned out, and I'm still not completely certain, but here's how the evening unfolded:

I dropped all five cones into the aquarium, along with the ten cowries. One of the first things I learned was that fifteen molluscs introduced into a 55-gallon aquarium can produce a lot of slime (or "snial slobber," [sic] as I believe one young lady put it on Conch-L). Within an hour, all the fish were running circles and gasping for air, so I took my skimmer and dipped out all the slime that I could catch, and repeated this exercise several times during the evening. It worked: eventually the water cleared up, and the slime bubbles stopped covering the surface.

It looked like things were shaping up for an absolute cowry slaughter from the very beginning. The cowries immediately hit the aquarium walls and headed for the top, and the big textile cone, Art, was the first to take chase, followed immediately by brothers Tom and Mark Episcopatus. All three headed for different *Cypraea caurica*; the first to reach one was Tom. It so happened this was the *Cypraea caurica* that had shed a piece of his foot earlier. His reaction made me realize why cowries aren't extinct. The cowry had crawled right to the water line, and positioned himself parallel to the water's surface, about a third of his shell above the water line. As Tom climbed up on the cowry, looking for an appropriate spot to harpoon his dinner, the cowry withdrew most of his foot into the shell, clinging to the glass with only the part of his foot extending above the water. Tom spent several minutes trying to figure out where he should sting the cowry, and then . . . crawled away!



Eduardo Magnificus has dined on a *Cypraea erosa*!

Art Textile had been climbing toward a cowry not far from the one Tom went after, but as he approached his prey, I suppose Tom's cowry either looked or smelled better. About the time Tom decided the situation was hopeless, Art thought he would give it a try, but the results were the same. He didn't seem to find a place to harpoon the guy either, so he turned his attention to a big fat *Cypraea arabica* a few inches away. The cowry stayed stationary while Art climbed up on him, and just when I was sure he was about to be eaten, the *arabica* released himself from the glass. Both he and Art tumbled to the bottom, breaking their union. While Art seemed a bit disoriented, the *Cypraea arabica* crawled over to the glass, and climbed straight back to his perch at the top of the aquarium.

Mark Episcopatus was also on the prowl at this time, and I got a bit more education by watching what he did. The third *Cypraea caurica* was easing along near the water line when Mark approached him from behind. Just as Mark touched him with his siphon, the *Cypraea caurica* seemed to realize he was in danger, and sped away from the cone! Judging by the interaction of these cones and cowries, I suspect all of the cowry species in my tank are capable of moving about five times as fast as any of the cones, at least moving horizontally on a vertical pane of glass.

Mark Episcopatus turned around and headed back toward brother Tom, and as they met, they seemed to tip their hats to each other, and continued on their way. They were certainly not in a cannibalistic mood with all the cowries crawling around, which was just as I expected.

(I initially had refrained from naming any of the cowries, as I feared they wouldn't survive long enough to justify names, but more to come, including the exploits of my *Cypraea lynx*, "Helmut.")

Cone Wars — Round 3

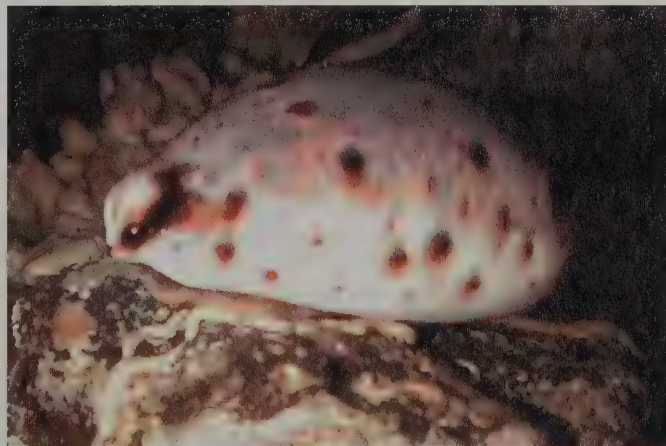
The cones in my aquarium were not having the greatest success catching dinner, even though cowries were swarming all around. The big *Conus textile*, Art, had already taken one fall from the top of the aquarium, and it wouldn't be his last.

Shortly after the two Episcopatus brothers, Tom and Mark, uneventfully passed each other near the surface of the aquarium, the first of the real cone interactions took place. Art had climbed slowly back to the top of the tank, and was easing toward one of the *Cypraea caurica* when he encountered Mark Episcopatus face to face. The two cones sniffed each other, then seemed to get tangled up a bit, each one apparently trying to climb over the other. In what appeared to be no more than a "Get out of my face!" gesture, Art zapped poor Mark! Once again, both cones tumbled to the bottom, but only Art Textile crawled away.

Marcus Episcopatus lay on his side, his foot extended only a couple of millimeters outside his aperture. He moved nothing the rest of the night except his siphon, which he could still extend and retract. The fish in the aquarium were beginning to show some interest in the disabled fellow, so I interfered and rotated his shell so that the aperture was down, affording him a bit more protection. Two days later, Mark was still in the same position.

Meanwhile, the *Cypraea lynx* (now called "Helmut") had made about five circuits of the aquarium, crawled over every rock and log and across the top of the aquarium (which is a couple inches out of the water), and investigated every nook and cranny. His next action surprised me once again. After the encounter with Mark, Art had climbed back to the top of the aquarium, and had his sights set once again on a lonely *Cypraea caurica*.

Helmut Lynx climbed to the top of the aquarium, made a 90-degree turn, and bore down on Art T., nose to nose. Instead of going around the textile or retreating from him, Helmut climbed directly over Art's foot and siphon and onto his dorsum, then stopped as if he had reached his destination. Within a few seconds, Helmut's weight caused Art to lose his grip, and (for the third time for Art) they tumbled to the bottom of the aquarium. Helmut immediately hit the wall of the aquarium and headed back to the top, but evidently Art had had enough. He crawled over to the *Cypraea erosa*, half tucked under a rock, and he remained there watching the *C. erosa* for the rest of the evening.



Helmut Lynx on one of his favorite perches.

Helmut wasn't finished. Apparently enjoying the ride with Art, he headed straight up the wall for Tom, the remaining healthy *Conus episcopatus*. Tom was slowly crawling toward a stationary *Cypraea caurica* at the water line when Helmut overtook him from behind. Helmut climbed up on Tom E.'s dorsum, this time from the spire, and once again stopped in the middle of the cone's back. The results were the same as with Art; within a few seconds Helmut had pulled Tom off the wall, and both plunged to the bottom. By now I was wondering whether this was some instinct Helmut was exhibiting, a new trick he had just learned, or purely coincidence. . . .

After his ride with Helmut, Tom *Episcopatus* had had enough excitement for the night, and decided to go to bed hungry. He righted himself, then stood up very tall, with more of his body exposed than I'd ever seen before. He lowered his head and began to bury himself in the gravel. Tom's shape lent itself well to this endeavor, and only his spire was visible within a minute or two. With Tom now buried, Art on an Erosa stakeout, and Mark paralyzed, I turned out the main aquarium light and the living room lamp, and got ready to go to bed. But within a few seconds, by the light from the kitchen, I saw *Conus magnificus* and Ross, the *Conus canonicus*, come to life. Heck, I had killed most of the night watching the first act of the drama. I figured I might as well stay up and watch the second act.

Cone Wars — Round 4

My experience with *Conus magnificus* in a collecting bag has always shown them to be rather shy, and *Conus canonicus* are usually not much more active. I was to change my opinion over the next few days, however.

After several motionless hours, Ross C. decided to explore his new surroundings a bit. He slowly climbed the wall of the aquarium, and cautiously approached the line of cowries near the water's surface. He stopped just short of the first *Cypraea caurica*, and extended his siphon to within a few millimeters of the cowry, but never made any attempt to harpoon it. After a few minutes, he moved around the unconcerned *Cypraea caurica* and headed for the next *C. caurica* in the line. This time he appeared to make a half-hearted attempt at catching cowry, but the his intended victim wasn't nearly as disturbed by Ross C.'s presence as it had been by Art Textile's approach. It slowly moved away, and Ross didn't follow. He simply meandered around the walls of the tank, and eventually crawled back down and staked his claim on one of the corners at the bottom.

Eduardo C. *Magnificus* hit the glass like he was hungry, and actually out-climbed all of the other cones in the tank. He didn't move nearly as fast as the cowries, but he was quite a bit faster than Art Textile, perhaps simply because he wasn't tentative, or perhaps all the cowry activity had excited him. In any case, he went straight to the top of the aquarium and rushed up to one of the big *Cypraea arabica*, which simply ignored him. Eduardo only paused for a moment, evidently discounting his chances, and then moved on over to the next cowry, which was the little fellow with three quarters of a foot that he had harpooned earlier in the day. Eduardo gave this one a closer inspection, but the *Cypraea caurica*'s trick that had worked on Art T. and Tom E. appeared likely to be successful yet again. He was still parallel to the water line, with most of his foot out of the water and the lower side of his shell against the glass. Eduardo was considering what

his plan of action was going to be, when around the corner came Helmut.

Now, Helmut Lynx had already pulled both Art and Tom off the glass this night by climbing on each cone's dorsum and allowing his weight to break the cone's hold on the aquarium wall. Would he do the same thing to Eduardo *Magnificus*? Amazingly enough, yes. Helmut approached from the side, and Eduardo saw him coming. He turned slightly toward Helmut, but the cowry never hesitated. Straight over Eduardo's foot, crumpling his siphon, onto his back... then he just stopped. Eduardo seemed to try to turn or tilt his shell away from Helmut's weight, but in a matter of a few seconds, both were headed for the gravel. Once on the bottom, Helmut quickly crawled over to the glass and resumed making his rounds, with Eduardo not far behind. Eduardo seemed to have the best memory of all the cones (or else he just held a grudge), because he devoted the next few days to chasing ONLY Helmut, completely ignoring the other cowries.

The bane of my tank has been one blue-and-yellow, inch-long, aggressive little damsel fish. The first thing he discovered about the cones in the aquarium was that every one of them has a little red bite of "food" attached to the tube that protrudes from the front of the shell, and he felt obliged to try to remove it from every cone in the tank! (All of these cone species are related, and each one has a banded siphon, red at the tip, with a white ring behind the red, and a black ring behind the white one.) It almost made me wish one of them had been a *Conus geographus*. (*C. geographus* are piscivorous and would have made short work of the aggressive little damsel fish!) After Eduardo's tumble, the fish harassed him for half an hour, alternating between Ed and his cousins. Then, for good measure, he zipped up to Helmut, and bit off his left eyestalk! I seem to recall a story of someone keeping a *Cypraea testudinaria* that regenerated an apparently-functional eyestalk in his tank (Scott Johnson in Kwajalein?), so maybe I'll see if a *Cypraea lynx* can do the same, assuming he survives. I was beginning to believe that Helmut was going to be at some disadvantage against Eduardo C. *Magnificus* with only one eye—when I noticed that Eduardo's right eye was missing too! I determined to remove the mean little fish the next day, but he has ignored the molluscs since that night, so I decided to let him stay.

By now I was fairly confident that nobody was going to become dinner this night, so I decided it was time to go to bed. As it turned out, I was mostly correct. The next morning, I went to the aquarium and counted cowries to see how everyone had fared overnight. I saw Helmut down in a corner behind some grass, and there were the *Cypraea arabica* huddled at the top of the aquarium. The juvenile *Cypraea talpa* had tucked himself into some branch coral, and the *Cypraea erosa* was near the spot I had left him. The *Cypraea caurica* were spread all over the aquarium, and I counted them: one, two, three, four, five... wait a minute, one, two, three, four, five... Yep, my aquarium had generated one additional *Cypraea caurica* overnight. I had brought home just four, so I can only guess that there was one in the clump of grass that I had brought in for the fish to graze on!

Mark E. was still where he had been the night before, and Tom E. was still mostly buried. Ross C. remained in the back corner of the tank, and Art Textile and Eduardo *Magnificus* had both gone underground.

(Continued in the next issue)

In Memoriam

Constance E. Boone

Dorothy Germer

ATSC to Celebrate the Millennium January 21-23

The Astronaut Trail Shell Club will be opening the year 2000 shell show season by celebrating their own 20th Shell Show. The event, entitled "20/2000 Space Coast Shell Festival" will be held on January 21-23, 2000 at the Melbourne Auditorium, Melbourne Florida. (See the Show Calendar, this issue). The Theme? "A Sheller's Vision for the New Millenium." There will be special categories to carry out the theme, along with special celebrations and recognitions at the banquet and Saturday Night Party. Ten Dealers will be participating and there will be an auction on Sunday afternoon. You won't want to miss this event.

Deep Water Corals Endangered

by Ross Mayhew

All over the world, many species of coral (both Octo- and Hexacorals) occur in deep water—down to 5800m. Their reef-building shallow-water relatives have long grabbed most of the glory, but the immense ecological and probable economic significance of deep-water corals is just now being realized. The work has just begun: They can't be reached by diving, so it is expensive and difficult to study the habitats they dominate. The most daunting current problem is that the deep-water coral "banks" or "forests" are being destroyed at a remarkable rate by dragging technology designed to crush or break off the branches of the coral "trees" (which grow to 15+ meters high = hundreds of years old—they are slow-growing!) without cutting or fouling the gear. The race is on now to find out more about this fascinating aspect of our World-Wide Ocean, and convince both fishermen and governments that it is in everybody's best interests to protect these ancient and productive, yet fragile ecosystems.

BX20005 RPO Spryfield, Halifax, Nova Scotia B3R 2K9 <rmayhew@ns.sympatico.ca>

This letter from Greek scientist Dr. Argyro Zenetos <zenetos@erato.fl.ncmr.gr> was forwarded by Maria Fontinetta Angioy, editor of La Conchiglia to all subscribers to Conch-L on Nov. 1. It is of concern to us all.

Dear Maria,

I am writing to you in connection with a serious miscarriage of justice which has taken place recently in The Ukraine. It has enormous potential implications on EU joint scientific projects the world over.

Dr Sergey Piontovski, of the Institute of Biology of the Southern Seas - IBSS (Sevastopol, The Ukraine) was arrested recently by the Ukrainian Intelligence Security Service (SBU) on charges of illegally transferring Ukrainian scientific information to the West, and being involved in illegal currency operations. It has been acknowledged by the SBU that the transfer of scientific information refers to projects of international scientific cooperation in marine ecology which he has worked on for the past five years. The SBU also stated that the illegal currency charges refer to the fact that Dr Piontovski received payment for his participation in these projects in hard currency. The following projects are those recognised by the SBU as illegal:

1. Project INTAS UA 95-80, funded by The European Union. The goal was to set up a joint database on marine ecosystems. Participants: Ukraine, U.K., The Netherlands and Russia.

2. Project of biodiversity of tropical plankton, funded by "Darwin Initiative" (DETR, U.K.). participants: Ukraine, U.K., Kenya and Panama.

3. Studies of bioluminescence of the ocean (joint program between Ukraine, U.K. and USA, funded by office of Naval Research, USA).

Dr Piontovski is accused of transferring biological and physical data of Ukrainian expeditions to the ocean to: Plymouth Marine Laboratory (U.K.), Amsterdam University (Netherlands), INTAS (EU), ONR (USA), Smithsonian Institution (USA), Royal Society (U.K.), Free University of Brussels (Belgium), ETI (Netherlands).

His arrest is clearly politically motivated and is an infringement of his human rights. Moreover, it implicitly accuses the EU, western governments and western scientific projects of being involved in espionage activities. Dr. Piontkovski is one of the leading marine biologists in the world. He is the author and co-author of over 60 papers, 3 monographs, 20 conference talks in over 15 countries. He is a member of International Steering committee of the GLOBEC program. For his own personal safety, and for the future safety of scientists and scientific projects the world over, it is imperative that immediate pressure be brought to bear on the government of the Ukraine to ensure Dr. Piontkovski's release.

I urge you to do everything in your power to force the EU and the governments of the United Kingdom, the USA, Russia, Kenya, Panama, the Netherlands and Belgium - all of whom are implicated in this affair - to insist on the Ukraine releasing Dr. Piontkovski immediately.

I am sure you understand the seriousness of this situation. I trust you will respond accordingly.

Argyro Zenetos



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Photos from page 14 story.

Figure 1. Three *Trichotropis cancellata* snails clustered around the opening of a sabellid tube-worm. The tentacles of the worm extend to the right. Photo by the author



Figure 2. A close-up of a *Trichotropis cancellata* stealing food from a sabellid worm. The white "tube" with a groove is the snail's pseudoproboscis. Cilia on the pseudoproboscis set up a countercurrent and allow the snail to steal food right out of the worm's mouth. Photo courtesy of B. Pernet.

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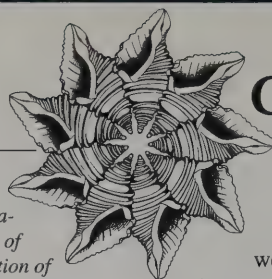
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In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: *Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.*

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MEMBERSHIPS are for the calendar year, January-December, late memberships retroactive to January. **1999 DUES:** (USA) \$20.00; **Postal Surcharge:** \$5.00 for Canada and Mexico; \$10.00 for other Western Hemisphere nations; \$12.00 for Europe; \$15.00 for Asia, Africa and the Pacific Rim. Please pay in U. S. dollars, or with a check on a U.S. bank with Transit Enrouting and Account Numbers printed at the bottom, or with money order; make checks payable to CONCHOLOGISTS OF AMERICA. **NEW MEMBERS AND ADDRESS CHANGES** go to Doris Underwood, **MEMBERSHIP DIRECTOR**. **RENEWALS** go to **TREASURER**, Bobbie Houchin. **BACK ISSUES** are available from **PROPERTIES DIRECTOR** Hank Foglino, 4 Trent Court, Smithtown, NY 11787-1266. Prior to 1985 \$3.00 each; 1985 to current \$5.00 each.

PRESIDENT'S MESSAGE

The future, the year 2000, is here. Many of the things we dreamed of as children have become reality. While some changes were startling, others were so gradual that we were hardly aware they were happening.

The past 100 years of molluscan study have brought many changes as well. Scientists now have equipment to scour depths never before seen. Photography and publishing have undergone a multitude of improvements. This too will change as we make new discoveries in the next 100 years.

Please take time in this new year to reflect on the people and the changes of the last 100 years that have made our study of shells what it is today.

I hope every one has Houston marked on his calendar for June. It promises to be a heavenly event.

Linda

LETTERS TO THE EDITOR:

In their separate reviews of *A Chronological Iconography* in the September issue [27(4):30], both Patty Jansen and Richard E. Petit suffer from a common geographical blind spot—and a huge one. Noting that the book is in an A4 format, Jansen says this is "universally accepted" but states that the United States is an exception. Petit writes that a four-hole binder for A4 paper is not normally available in the U.S.

There is a country larger than the United States and both larger and more populous than Australia where A4 paper and binders are not readily available. Since Canada and the U.S. together constitute a hunk chunk of the globe, it seems a bit of a stretch to then state that the A4 size is universally acceptable. On those grounds, the description "archaic" also seems a bit overblown, since "antiquated" and "not in ordinary use" are accepted definitions for archaic and a paper size of 8½ inches by 11 inches is still in ordinary daily use in the world's largest economic marketplace.

Peter Calamai

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In Memoriam

Margaret Carpenter

William Shaw

Ben Wiener

COVER CREDITS: COVER: Rachel Crawford Imlah, our March cover artist, has photographed for our pleasure a 266 mm specimen of *Lambis truncata sebae* (Kiener, 1843) taken live in one meter on back reef, 70 km. North of Yanba al-Bahr, Saudi Arabia, Red Sea. The species is also found in the Persian Gulf and in the western to central Pacific. Rachel is a widely studied, experienced, and gifted painter and photographer "inspired by the seasons of Life to compose images that emerge from the strayed world of dream vision." Her painting is chiefly restricted to floral images, while her photography is directed toward shells. Her interest in photographing shells began when she lived on the shores of the Red Sea. She continued her studies in the collections of the Smithsonian and the American Museum of Natural History. Rachel may be reached at 199 Markham Street, Middletown, CT 06457. For a brochure of her fine art shell prints call Rachel at (860) 347-7464.

*The Houston Conchology Society
takes great pleasure in hosting
COA 2000*

A JOURNEY TO THE STARS

June 22 - 26 at

*The Wyndham Greenspoint Hotel
12400 Greenspoint Drive
Houston TX 77060
281-875-2222*

Convention rates begin at \$89 plus tax.

The Wyndham Greenspoint Hotel offers complimentary airport shuttle service from Houston's George Bush Intercontinental Airport.

The Wyndham Greenspoint is located approximately 40 minutes north of downtown Houston near the intersection of Interstate-45 and the Sam Houston Tollway.

A pre-convention field trip on Wednesday June 21 to the Brazosport Museum of Natural Science will be followed by time to walk the beach or relax by the warm waters of the Gulf of Mexico. This pre-convention field trip is a wonderful opportunity to visit with others attending the convention.

The COA 2000 Convention begins on Thursday June 22 with Opening Ceremonies in the morning and the Welcome Party in the evening.

During the convention, the days will be filled with wonderful programs, terrific silent auctions and plenty of time to talk shells.

On Friday, participants will see The Strake Hall of Malacology and The Cullen Hall of Gems and Minerals at the Houston Museum of Natural Science.

The Auction is scheduled for the afternoon of Saturday June 24.

The Bourse will be held on Sunday June 25 and Monday June 26.

The COA 2000 Convention will end with the Banquet on Monday evening.

A post-convention field trip for a full day in Galveston is scheduled for Tuesday June 27. Activities for the day will include a tour of the Marine Biomedical Institute at The University of Texas Medical Branch to see first hand the fascinating research being done with Cephalopods.

For more information about the convention contact:

COA 2000
PO Box 1317
Tomball TX 77377-1317

Lucille Green
COA 2000 Convention Chairman
Email <dgreen@comwerx.net>

Flowers to.....

Mique Pinkerton who has just had cancer surgery. We pray all went well and hope things are soon back to normal, Mique!

Ruth Anne Sparlin, COA's Parliamentarian, who is undergoing some very radical chemotherapy for cancer. Ruth Anne, we're pulling for you and praying for you all over this country and the world!

AUCTION DONATIONS

A JOURNEY TO THE STARS: COA 2000 HOUSTON TEXAS • JUNE 22-26, 2000

Howdy! COA 2000 will be held June 22-26, 2000, at the Wyndham Greenspoint Hotel in Houston, Texas, 4th largest city in the United States. TEXANS take great pride in showing their hospitality and this year's convention will be no exception.

The annual auction, held during the convention, is the major fund-raising event for the Conchologists of America. The proceeds from the auction support grants for research and study in the fields of conchology and malacology, the publication of the *American Conchologist*, and the general operation of COA. Your participation, by way of donation, will ensure that COA has the funds necessary to support these projects.

As chairman of this year's auction, I am requesting your support. Donations of rare shells, specimen shells, fossil specimens, coral specimens, shell books, shell art, shell photography, and other shell-related items would be greatly appreciated.

Your donations are now **TAX DEDUCTIBLE**. COA has finally received its 501(c)(3) tax status. Now is a great time to make your donation. Benefit COA and receive a tax deduction for your donation.

Donations need to be received by **Friday, May 26, 2000**.

Please send your donations to:

COA 2000 • Dave Green, Auction Chairman
PO Box 1317 • Tomball, Texas 77377-1317

Texas history is full of great and important dates and Saturday, June 24 will be no exception. With your help, we can put together a great auction. If you have been waiting for donations to COA to be tax deductible, the time is now. We welcome all donations, large or small, even entire collections. If you have any questions I can be reached by phone at 281-376-5630 or by email at <dgreen@comwerx.net>. Please give generously! Thank you for your donation.

See you in Houston in June!
Dave Green, COA 2000 Auction Chairman

BE A GOLDEN STAR — PATRONS NEEDED A JOURNEY TO THE STARS: COA 2000 HOUSTON TEXAS • JUNE 22-26, 2000

Here is your chance to support COA in a very special way. For a donation of \$50 or more you can be a **Golden Star** "Patron of the Convention."

The annual convention is the only fund-raising event for the Conchologists of America. The proceeds from the convention support grants for research and study in the fields of conchology and malacology, and the general operation of COA. If you would like to help defray some of the costs of the convention, your contribution will be greatly appreciated.

All contributions received by **Friday, May 26, 2000** will be acknowledged in the Convention Program booklet.

Contributions can be included with the registration fee, or contributions can be sent directly to:

COA 2000 • **Golden Star** "Patron of the Convention"
Steven Coker, Treasurer
PO Box 1317 • Tomball TX 77377-1317

Even if you can not personally attend this year's convention, you can still participate as **Golden Star** "Patron of the Convention." Thank you for your support!

MAR 16 2000

BRAZILIAN DEEP WATER SHELLS

by José Coltro

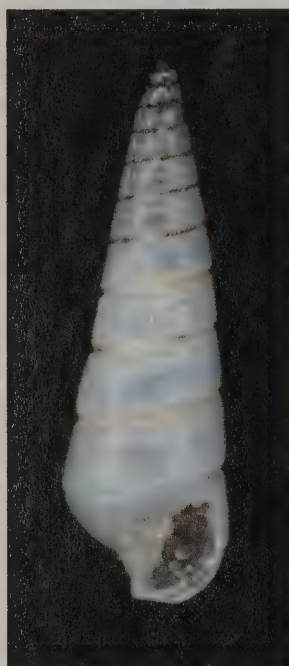
All shells pictured were taken off Santos, São Paulo State, trawled at 90-100 meters. All photos by the author.

Deep water material from Brasil is quite hard to get. The only ordinary sources are shrimp boats that trawl along the coast, or the occasional research boats. In years past my brother Marcus and I dredged in a very few spots ourselves, using a friend's boat along São Paulo's coast or using our diving boat off Guarapari. Both locations proved to be great for shells. Besides known species, we found many new ones for science, species like *Calliostoma vinosum* Quinn, 1992; *Calliostoma viscardi* Quinn, 1992; *Turbo heisei* Prado, 1999; *Attiliosa perplexa* E.Vokes, 1999; *Pazinotus bodarti* P.M.Costa, 1993; *Pisania*

bernardoi Costa & Gomes, 1998; *Anachis carloslirai* P.M.Costa, 1996. Unfortunately our dredging trips stopped about two years ago and deep water material disappeared.

For many years we tried to get material from shrimp boats, and especially to get small shells. But it is very hard to deal with fishermen. The boat captains (Here we call them the boat chiefs) normally don't allow employees to collect anything besides shrimp. Sometimes they get large shells...*Adelomelon becki* (Broderip, 1836), *Zidona dufresnei* (Donovan, 1823) or *Chicoreus tenuivaricosus* (Dautzenberg, 1927)...that they normally hate because these shells destroy the nets. Very few other shells are saved. From time to time a few boat chiefs will allow the cook boat to collect some shells and it is very exciting to receive those shells.

Finally a few months ago a young Brazilian biologist was able to convince a boat chief to save material for him. He selected some of the shells (he works with Acteonidae) and all the others he sent to me. The



Eulimella rudis Watson,
1885, 7.6 mm.



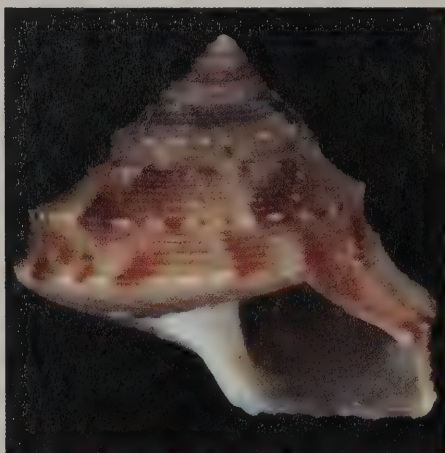
Fusiturricula taurina
(Olsson, 1922), 12 mm.



Aesopus metcalfei
(Reeve, 1858), 10mm.



Ancilla dimidiata (Sowerby,
1850), 19mm.



Calliostoma nordenskjoldi Strebel, 1908,
9mm.



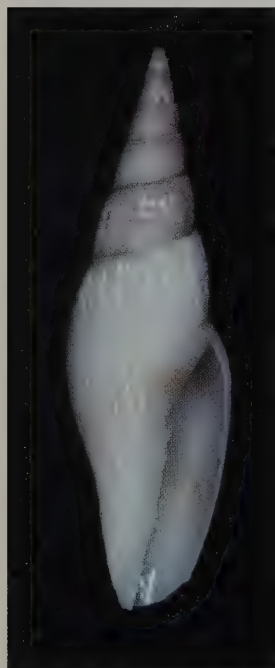
Calliostoma brunneopictum Quinn, 1992, 8 mm.



Solariella carvalhoi Lopes & Cardoso,
1958, 9 mm.

material saved for us is collected in the mud brought up by the net. The crew saves the mud in small containers and the biologist selects the shells. Some fantastic small species have started to appear, like *Calliostoma brunneopictum* Quinn, 1992; *Calliostoma nordenskjoldi* Strebel, 1908; many species of *Turbonilla*, *Epitonium*, *Turritella*, *Natica*, *Polinices*; *Trophon pelseneeri* E.A.Smith, 1915; *Typhina riosi* Bersch & D'Attilio, 1980; *Typhis clerii* (Petit, 1842); *Nassarius*, *Ancilla*, *Conus* and especially Turridae. Over 45 different Turridae species were found, many of them new to science. Some are really

attractive: *Fusiturricula maesae* Rios, 1985; *Ithycythara hyperlepta* Hass, 1953; *Leucosyrinx hemimeres* (Watson, 1881), or *Thelecythata mucronata* (Woodring, 1928). Other new species have been found, like small Muricidae, Naticidae, Pectinidae, Buccinidae, etc. Most of this material is being studied by biologists of University of São Paulo and I hope very soon they will be described and named – It seems that, with serious research, it will be possible to find here in Brasil hundreds of new species!



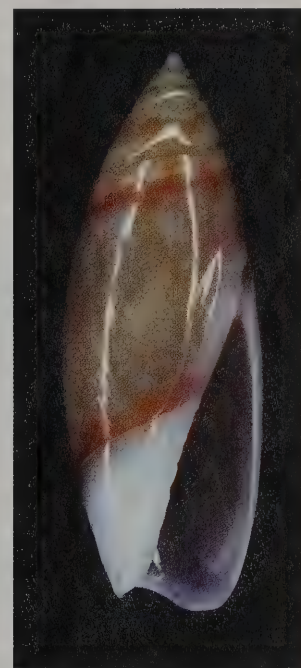
Cancilla larranagai
(Carcelles, 1947), 25 mm.



Latirus devyanae Rios, Costa &
Calvo, 1994, 26 mm.



Mysouffa cumingii (A.Adams,
1854), 13 mm.



Olivella defiorei
Klappenbach, 1964, 12 mm.



Pleurotomella aguayoi (Carcelles,
1953), 35 mm.



Leucosyrinx hemimeres
(Watson, 1881), 17.5
mm.



Veprecula cf. morra (Dall,
1881), 12 mm.



Ithycythara hyperlepta
Hass, 1953, 6 mm.

A Trip to Remember

by Bret Raines

The *Tura* had been anchored in the lagoon for less than a hour, and already divers were in the water and dredging teams were making their first runs. The morning was breezy, but the air was clean and fresh. As I stared at the small remote isle known as East Diamond, I could hardly believe I was here. Rumor had it that at least twenty years had passed since the last real collecting had been done in the area. While our dredge was digging along the bottom, I was enjoying the sun and the water. I thought to myself, "It just doesn't get any better than this." However, it wasn't long before I realized that I was wrong. Someone yelled out a name, a name that all had waited in anticipation to hear. As if it had been orchestrated, all dingy motors were stopped, and there was an eerie silence as everyone strained to listen. Then from the furthest dingy out, you could clearly hear the bark, "*PERPLICATA!* *Cymbiolacca PERPLICATA!*"



Now before I go any further, I must tell you that prior to our arrival in this remote area of the Coral Sea, we all knew that this was not going to be a pleasure cruise. The trip was not for wusses, whiners or wimps. From Gladstone Harbor the travel time was over 32 hours by boat, and even when the Coral Sea is halfway calm it's not a pleasure trip. Despite the length of our boat ride, the journey was quite bearable. This would not have been true if it had not been for our gracious hosts, Doug Thorn and Chris Pike, who did everything they could to make this a trip to remember. Chris was constantly on the move, working, cleaning and preparing meals. If you had not known it, you would have thought he was a deck hand rather than the boat's owner. Both Doug and Chris grew up on the ocean, and Doug has probably shelled more areas within and along the Great Barrier Reef and the Coral Sea than anyone alive today. With every year that goes by, another area will be explored.

You can find East Diamond Island at S 17 26' 109"; E 151 03' 588"; however, you don't need to be an experienced navigator to find the place. Simply find Cairns, Australia on your globe with one finger, then find the southernmost tip of New Guinea with another finger.

(Please note it is suggested that you use fingers associated with different hands unless you are really limber.) Now keeping your globe steady between both knees, move your finger on Cairns due east and at the same time move your other finger directly south (the one that better still be on the southern most tip of New Guinea). You'll find the island where your two fingers touch. Although it's the largest land mass in the area for hundreds of miles, it is less than 1/2 mile long and maybe 1/8 mile wide. This small island is covered with green vegetation, and is bordered by the most magnificent and pristine lagoon imaginable. It is also home to literally tens of thousands of birds, most prominent of which are the frigates and boobies.

One memory about the trip which I will always have is the silence as we approached and circled the island. Very few words at all were spoken; the sounds that were made were only whispers. Everyone aboard was overcome by the beauty and were simply awe-struck. However, once the boat was anchored in the lagoon, all that changed. Although we probably sounded like a high school pep rally due to our excitement, we looked like a precision military drill team as we brought up our gear and prepared for our fortnight stay in paradise.

Each day started long before the sun was up and most of the time our days did not end until after dusk. I remember one day my dredging partner and I were having such great success that we did not come in for breakfast or lunch. Our day finally ended about 8 p.m. We had found areas so plentiful with shells that it was impossible to bring up an empty dredge. Everyone was either diving or dredging the entire time, and there were days when the only time you had a chance of seeing someone was at the dinner table. Most nights this was our gathering place where everyone was either talking about shells, telling jokes or reminiscing over the day's haul.

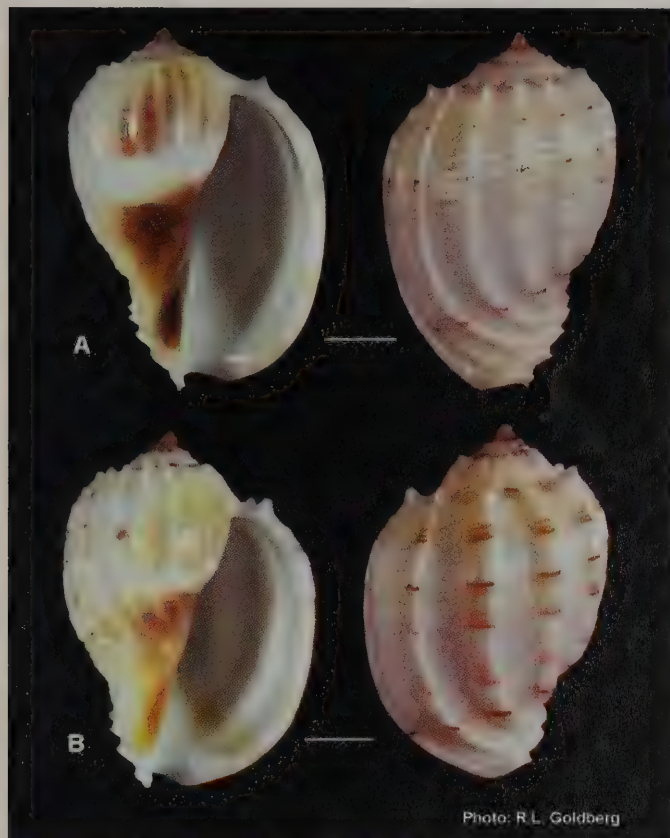
Everyone on the trip was here by invitation and the group consisted of seasoned hardcore shell collectors from around the world. All politics, religions, degrees and social status were left back at home. We were here to shell and nothing else mattered, (except for maybe fortune and glory). The trip was especially nice for me because I finally got a chance to meet, face to face, collectors whom I had known at a distance and traded with for years. Something else I noticed that was really neat: the camaraderie among the group and the sharing of secret shelling techniques—a phenomenon rarely ever witnessed.

We all had our tricks of the trade and special tools for collecting shells, ranging from simple tools such as a bent wire for extracting shells out of holes to a hi-tech suction dredge tube for gathering microshells. I also thought I knew quite a bit about dredging, but that was before I met Malcolm Ford and saw his 50 pound MK-7 dredge. Malcolm is part shell collector, part engineer and part superman! Unanimously dubbed by the group as the "Dredge Master," he has spent over 23 years perfecting his dredge design. I realized I should have eaten my Wheaties when I saw him reach over the side of the dingy and, single handedly and with no apparent effort, pull the fully loaded dredge out of the water.

During our stay we collected many shells, some perhaps new to science. Variety, size and condition were simply unbelievable. At the end of each day the group would gather around the shell staging area to see what had been found. On a daily basis, specimens came up that were more fabulous and larger than current listed world records. There were also fantastic and rarely seen color forms.

I was most intrigued by two species. First on the list, without a doubt, was *Cymbiolacca perplicata*. For rarity and beauty in a species, a fresh collected *C. perplicata* is hard to beat. Another shell I fell in love with appears to be a very unusual dwarf white color form of *Harpa major*. It is so unusual that I am tempted to write a formal paper on this little guy.

These two harps were collected within the lagoon at 40 to 50 feet in pure white sand. More than a dozen were actually found and the average height was 40mm. Now for the real questions. Are they some-



thing new or just a geographic variation? Are the size and coloration a result of environmental influence: the pure white sand and restriction to the lagoon habitat? An interesting note to consider: in addition to this species we also collected *Harpa amouretta* and *Harpa harpa* in the same location; these habitat characteristics have no apparent effect on their size or coloration. Specimens A and B depict the extremes in color variation and shell structure. Shells appear to be adult, yet they are light weight compared to other, similar-sized specimens of *Harpa major*.

Notice the cancellated sculpture in the close up image. I've seen this before in juvenile specimens of several species, but never before in older shells. The soft animal is also white with tiny yellow specks of color. The rear portion of the foot is mottled with yellow and red-



dish brown spots. Eye stalks and siphon are white with yellow and orange spotting. I would be very interested in hearing the opinion of others on these little harps.

Now back to the trip. If I have a complaint at all, I would say it was the food. It was great, and I know that I gained 10 pounds! I was expecting cold sandwiches and generic soda, but that was not the case. We ate well, very well! There was fresh fruit every morning with our eggs, sausage and toast, and there was always a hot meal at dinner. I can remember steak at least twice, and one night we had prawns that were as big as small lobsters. Also, regardless of the meal being served, a big jar of Vegamite was always available for your enjoyment. Yuk!

I am also happy to report that a special effort was made to ensure that we did not damage the live reef. Protected species were left untouched and we left East Diamond as we found it, minus a few shells. :-)

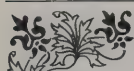
I look forward to having the opportunity to visit the land down under again and to met some more new friends.

I would also like to thank Rich Goldberg for the great job he did of making these images for me.

Below is a list of the identified species that were collected from the waters surrounding East Diamond Island:

- | | | | |
|--|---|--|---|
| <i>Antigona lamellaris</i> Schumacher, 1817 | <i>Cypraea mauritiana</i> Linnaeus, 1758 | <i>Lambis truncata</i> Humphrey, 1786 | <i>Strombus erythrinus</i> Dillwyn, 1817 |
| <i>Architectonica perspectiva</i> Linnaeus, 1758 | <i>Cypraea testudinaria</i> Linnaeus, 1758 | <i>Lioconcha fastigata</i> Sowerby, 1852 | <i>Strombus gibberulus</i> Linnaeus, 1758 |
| <i>Calliostoma monile</i> Reeve, 1863 | <i>Cypraea tigris</i> Linnaeus, 1758 | <i>Mammilla opaca</i> Récluz, 1851 | <i>Strombus haemastoma</i> Sowerby, 1842 |
| <i>Cardita crassicauda</i> Lamarck, 1819 | <i>Distorsio anus</i> Linnaeus, 1758 | <i>Mirapecten rastellum</i> Lamarck, 1819 | <i>Strombus lentiginosus</i> Linnaeus, 1758 |
| <i>Cardium aurantiaca</i> Adams and Reeve, 1850 | <i>Distorsio reticulata</i> Röding, 1798 | <i>Mitra mitra</i> Linnaeus, 1758 | <i>Strombus luhuanus</i> Linnaeus, 1758 |
| <i>Cardium fragum</i> Linnaeus, 1758 | <i>Drupa morum</i> Röding, 1798 | <i>Morula uva</i> Röding, 1798 | <i>Strombus variabilis</i> Swainson, 1820 |
| <i>Casmaria erinacea</i> Linnaeus, 1758 | <i>Drupa ricinus</i> Linnaeus, 1758 | <i>Nassa sarta</i> Bruguière, 1789 | <i>Strombus vomer</i> Röding, 1798 |
| <i>Cerithium fasciatum</i> Bruguière, 1792 | <i>Drupina grossularia</i> Röding, 1798 | <i>Natica solida</i> Blainville, 1825 | <i>Strombus vittatus</i> Linnaeus, 1758 |
| <i>Conus floccatus</i> Sowerby, 1841 | <i>Engina medicaria</i> Linnaeus, 1758 | <i>Naticarius oncus</i> Röding, 1798 | <i>Strombus urceus</i> Linnaeus, 1758 |
| <i>Conus imperialis</i> Linnaeus, 1758 | <i>Epitonium hyalinum mokuolensis</i> Pilsbry, 1921 | <i>Nerita chamaeleon</i> Linnaeus, 1758 | <i>Tellina pulcherrima</i> Sowerby, 1842 |
| <i>Conus marmoreus</i> Linnaeus, 1758 | <i>Excellichlamys spectabilis</i> Reeve, 1853 | <i>Neritopsis radula</i> Linnaeus, 1758 | <i>Tellina quoyi</i> Sowerby, 1842 |
| <i>Conus quercinus</i> Solander, 1786 | <i>Fimbria fimbriata</i> Linnaeus, 1758 | <i>Oliva miniacea</i> Röding, 1798 | <i>Terebra guttata</i> Röding, 1798 |
| <i>Conus tessellatus</i> Born, 1778 | <i>Gloripallium pallium</i> Linnaeus, 1758 | <i>Oliva tessellata</i> Lamarck, 1811 | <i>Terebra maculata</i> Linnaeus, 1758 |
| <i>Conus textile</i> Linnaeus, 1758 | <i>Gloripallium speciosum</i> Reeve, 1853 | <i>Philippia radiata</i> Röding, 1798 | <i>Terebra subulata</i> Linnaeus, 1758 |
| <i>Conus virgo</i> Linnaeus, 1758 | <i>Haliotis ovina</i> Gmelin, 1791 | <i>Phos senticosus</i> Linnaeus, 1758 | <i>Terebellum terebellum</i> Linnaeus, 1758 |
| <i>Cymatium pyrum</i> Linnaeus, 1758 | <i>Haliotis varia</i> Linnaeus, 1758 | <i>Polinices mellosus</i> Hedley, 1924 | <i>Trochus maculatus</i> Linnaeus, 1758 |
| <i>Cymbiolacca perplicata</i> Hedley, 1902 | <i>Harpa amouretta</i> Röding, 1798 | <i>Polinices pyriformis</i> Récluz, 1844 | <i>Trochus pyramis</i> Born, 1778 |
| <i>Cypraea argus</i> Linnaeus, 1758 | <i>Harpa harpa</i> Linnaeus, 1758 | <i>Rhinoclavis vertagus</i> Linnaeus, 1758 | <i>Tudicula armigera</i> A. Adams, 1855 |
| <i>Cypraea childreni</i> Gray, 1825 | <i>Harpa cf. major</i> Röding, 1798 | <i>Semipallium flavicans</i> Linnaeus, 1758 | <i>Tudicula rasilistoma</i> Abbott, 1959 |
| | <i>Hydatina amplistre</i> Linnaeus, 1758 | <i>Semipallium fulvicostatum</i> Adams & Reeve, 1850 | <i>Vasum ceramicum</i> Linnaeus, 1758 |
| | <i>Laevichlamys bretinghami</i> Dijkstra, 1998 | <i>Solidula solidula</i> Linnaeus, 1758 | <i>Vasum turbinellum</i> Linnaeus, 1758 |
| | <i>Laevichlamys lemniscatus</i> Reeve, 1853 | <i>Spirula spirula</i> Linnaeus, 1758 | |
| | <i>Laevichlamys squamosa</i> Gmelin, 1791 | <i>Strombus dilatatus</i> Swainson, 1821 | |
| | <i>Lambis chiragra</i> Linnaeus, 1758 | <i>Strombus epidromis</i> Linnaeus, 1758 | |

Many more unidentified species of both bivalves and gastropods were also collected.



Ben Wiener

Ben Wiener was born in 1914 in a small town in Poland. His father came to America with his older brother to get settled and young Ben and his mother and two other brothers came a few years later. The family settled in Monsey, New York in about 1918. Ben took pre-med courses at Cornell University but decided that medicine was not his major and dropped those classes.

During WW II, Ben served with the U.S. Army in the Pacific Theater. After the war was over he sailed throughout the Caribbean and through the Panama Canal to the Pacific with a friend who had a 40 foot boat. After that trip he moved to Miami to be near a brother, where he owned and operated a retail hardware store until his retirement in 1980.

Ben and Josie met in 1954 at a class on Retail Merchandising given by a consortium of merchants in the Miami area. Josie says, "I picked him up at the class." Their early dates consisted in part of Jai Alai, the dogtrack, skating and "submarine watching." Josie left Miami to work in other places but their romance continued long distance until Ben went to San Antonio, Texas and captured Josie and brought her back to Miami.

In 1964 they vacationed in Sanibel where they began their love affair with shells. Their first shelling trip out of the country was with a Kirk Anders tours to Australia. There they met many of those shelling friends that they have to this day. They went to Keppel Bay, McKay and Cairns. On a shelling trip to Fiji, one of the native Fijians remarked to Ben, "You know, we used to be cannibals and eat people." Ben said, "I hope you wouldn't eat me, I am too small." The native replied, "We would have you for dessert." In their shell collecting trips, Ben would help find and clean the shells, while it was Josie's job to identify them. Ben and Josie traveled to over 23 countries. They went to Australia, one of their favorites, 5 times. Ben went back to his hometown in Poland once with two of his brothers and a nephew. No wives were allowed on that trip.

They began their shell club membership in Miami and then Broward where they could both always be counted on to give 100%. They have been members of COA for 20 years, attending 17 conventions. Ben and Josie sold raffle tickets at seven COA conventions, from Long Island to Orlando. While they thoroughly enjoyed all the



Ben and Josie in a his 'n'hers shell outfit.

conventions, a few favorite memories came to mind as Josie reminisced. One of the first COA conventions they attended was in Key West, FL where a hurricane was brewing offshore. The strong winds blew sponges up on the beach by the score and Ben and Josie filled up their car. Even though they double-bagged the sponges, they had the stinkiest car in Key West. It was a long ride back to Miami.

Another memory for Josie was of the kindness of COA members. Ben got sick at the Panama City convention and had to be hospitalized; he always spoke of the kindness of Jim and Linda Brunner who put them up after Ben was released from the hospital. One of Ben's favorite times at conventions was when Josie would go shopping with Walter Sage for fabrics. He was eager to see what she brought back for their latest his 'n' hers outfits as well as hearing the stories of Walter's and Josie's travels to the fabric marts. Ben also remembered the kindness of the COA members when he was hospitalized and received a card with 86 signatures from the members at the Corpus Christi convention.

We will all miss Ben greatly.

— Carole Marshall

Josie thanks everyone for their cards, notes and phone calls.



VALENTINES?

VALENTINES?

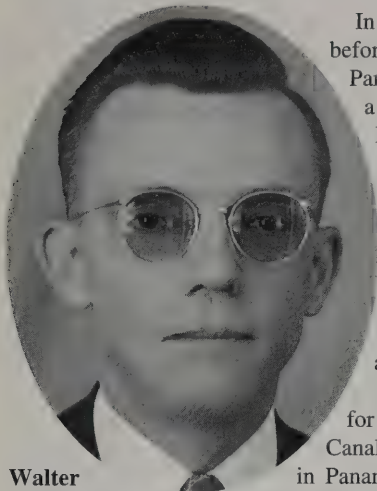
The *Charonia lampas* on the right has been in an aquarium since June 1995, and in Mariette Jearey's own aquarium since August 1998. She dived the one on the left, hoping it was the opposite sex, and placed it in the same aquarium. Next morning she found them in this pose. "Ah, cute!" she thought. "They're getting romantic." Meanwhile they were fighting a massive chemical war, over territory, she guesses, and quips, "They must have been males!" Within two days the newcomer was dead, and so were lots of other creatures in the tank as well, three *Cypraea capensis* among the casualties. A dear lesson, she reports, "Don't try to play Cupid—you'll only look stupid." Mariette lives in the Republic of South Africa.

WSM SCHOLARSHIP ANNOUNCED

The Western Society of Malacologists, with the Santa Barbara Malacological Society, the San Diego Shell Club, and the Northern California Malacozoological Club are offering in 2000 the Student Research Grants in Malacology. Research focused primarily on systematics, biology, ecology, physiology, or paleontology of marine, freshwater or terrestrial mollusks is eligible. Funds are available for actual research costs to full time students in formal graduate or undergraduate degree programs. Contact Henry Chaney, Department of Invertebrate Zoology, Santa Barbara Museum of Natural History, 2559 Puesta del Sol Road, Santa Barbara, CA 93105 USA. 805-682-4711, ext. 334 (voice); 805-963-9679 (fax); hchaney@sbnature2.org

COA Receives Part of Clark Collection

by Linda Brunner



Walter
Clark (1937)

In 1919, approximately one year before the official opening of the Panama Canal, Marjorie Higgle, a native of Kansas, journeyed to Panama to join her brother and work for the Panama Canal Company, a corporation of the United States government. Imagine an unmarried young woman of this era traveling to a foreign country to work and you have a picture of spirit and adventure.

Majorie worked as a secretary for the dredging division of the Canal Zone Operation. While living in Panama her interests grew and she became passionate about two new loves...her new husband, Walter Clark, whom she met and married in Panama, and shells. A Pennsylvania native, Walter was the Director of Panama's Balboa Clubhouse. Marjorie and Walter shared a love of shell collecting and often went shelling on the islands around Panama after big storms. They labeled each of their shells carefully and stored them in various containers: match boxes, incense boxes, typewriter ribbon tins, pill bottles and cigar boxes. (As the club director Walter probably had access to an unlimited supply of cigar boxes.) After the Clarks returned to the United States in 1946, they continued to pursue shells through trading and letters. Walter corresponded frequently with Myra Keen and Maxwell Smith, and Walter and Marjorie donated many specimens to Stanford University. The Clarks settled in P.O. Box 8188, Southport FL 32409-8188 Email: jili@panacom.com

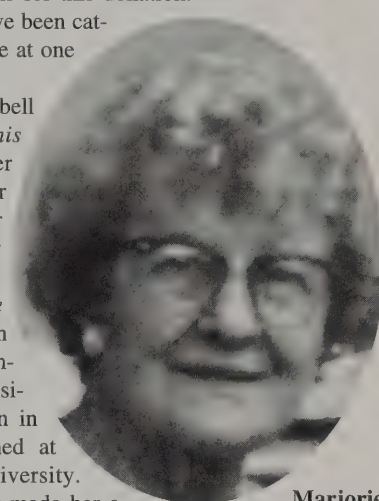
Palatka, Florida on the St. Johns River with their Boston Terriers until Walter's death in 1968.

Marjorie donated a large part of their collection to the University of Tampa. Although she was legally blind and crippled with arthritis when she reached 95, Marjorie never complained. When she had trouble getting up out of a chair she would say with a twinkle in her eye, "When I worked in the Canal Zone we had the two largest derricks in the world--the Atlas and the Hercules. That's what I need to get me out of this chair!" She remained a cheerful, gentle soul until her death in 1990 at the age of 98.

COA is honored to receive from Marjorie's nephew and his wife, Walt and Ellen Newsom, a large portion of Marjorie and Walter's collection of shells and papers. Their records are meticulous. COA is most grateful to the Newsoms for this donation.

As soon as the specimens have been catalogued they will be available at one or both convention auctions.

In 1964 Keen and Campbell named the beautiful *Typhis clarki* in honor of Walter Clark. While named for Walter it was meant to honor both Marjorie and Walter for their generosity and scientific study of mollusks. (*The Veliger*, July 1, 1964). In honor of Marjorie's independence and proficiency in business a scholarship to women in business has been established at Mississippi State University. Marjorie's spirit and intellect made her a pioneer who became a thoroughly modern woman.



Marjorie
Clark in later life

Margaret Helen Carpenter

Margaret Helen Carpenter, known to all who knew and loved her as "Peggy," died December 8, 1999 at her home in Herndon, VA.

Peggy and her husband LTC Walter N. Carpenter II, USAR (RET) twice amassed collections of near perfect shells that rivaled the very best. The first collection was lost to fire when they were stationed overseas. Returning undaunted to the U.S. to start a second collection, they succeeded in surpassing their first efforts. Although they collected everything, Peggy's passion was pectens, not only perfect ones, but also world record size specimens.

Peggy and Walt were active COA members and charter members of the National Capitol Shell Club; each had served as NCSC president, as well as holding various other offices. Peg was active as a docent at the "Learning Center" at the Smithsonian Institution where she enriched the lives of the many who attended her sessions. Walt is also known for his beautiful water color paintings of shells. These

were on display at the Melbourne, Florida COA convention in 1990. The Carpenters parted with their collections a short time ago due to health and other problems, a move which caused them much pain and many regrets.

Although the Carpenters retired from shell collecting altogether, they will be long remembered...and envied...for the shell collecting lives they have led. LTC. Carpenter will remain at their home in Herndon, Virginia and will, hopefully, produce many more of his wonderful shell pictures.

— Mique Pinkerton



TIPS FOR COLLECTORS

Humidity a Problem?

Jim Movich on Conch-L tells us that he uses Humidity Indicator Cards in his cabinets and drawers. They contain three circled spots to indicate Relative Humidity: 50%, 40%, and 30%. Dimensions are 1" x 1 1/2", with black lettering on blotting paper. To obtain these cards Jim suggests we call BioQuip Products, Inc. at (310) 324-0620. The cards run \$2.20 for a pack of 3 (# 1195C) or \$8.00 for a pack of 12 (#1195D). Their phone number is (310) 324-0620 or they can be reached at <bioquip@aol.com>. Thanks for the tip, Jim.

Invisible Ink

There has been a lot of talk on Conch-L recently about numbering the shells in our collections. Some of the participants in the discussion said that they preferred not to put black numbering on their shells. Mique Pinkerton offered them a great solution. Invisible ink! She found a source for invisible ink pens manufactured by Sanford and the black lights used to read the ink. If you are interested: the Kiefer Supply Corp., 417 Stanton Ave. West, Fergus Falls, MN 56537 Phone (218) 736-7000, Fax: (218) 736-7474 www.kiefers.com and Toll free order line (888) 543-3377. Catalogues available on request.

CONCHATENATIONS

by Gary Rosenberg

Note: In my column on species concepts last September, I said that I would elaborate on ecophenotypic variation in my next column. The issue turned out to be more complex than I expected, so I didn't have it ready for the December issue. I've decided to bump it to the June issue, so that I can present this month's topic in a timely manner.

The new International Code of Zoological Nomenclature

The fourth edition of *The International Code of Zoological Nomenclature* went into effect on January 1, 2000. I summarize here some of the differences between the fourth edition and the third, which was in effect from 1985 through 1999. The basic object of the code is unchanged: "to promote stability and universality in the scientific names of animals and to ensure that the name of each taxon is unique and distinct."

Perhaps the most important changes are those that allow authors to preserve established usage, without need to petition the International Commission on Zoological Nomenclature (ICZN).

1) A name that has not been used as valid since 1899 can no longer displace a name that has been used as valid by at least ten authors in 25 publications during the last fifty years, over a span of more than 10 years. This is called reversal of precedence, and it applies to both synonyms and homonyms. The younger name can be called a *nomen protectum* and the older name a *nomen oblitum* (Article 23.9). If an author invokes this rule incorrectly (that is, it is found that the older name has been used since 1899) then the case is to be referred to the ICZN (Article 23.10). If such a rule had been in place 100 years ago, many of Röding's names would not have displaced those of Lamarck.

2) The particular spelling in prevailing use for a name will be maintained, even if it is not the correct original spelling (Article 33). For example, the fossil cowrie *Siphocypraea henekeni* (Sowerby, 1850) was first named as *Cypraea henikeri* because Sowerby was not aware of the correct spelling of Mr. Heneken's name. Since "*henekeni*" is in prevailing usage, that spelling can be maintained.

3) If a family-group name in general use is younger than the name used for one of its subordinate taxa, the higher ranking name is not to be displaced (Article 35.5). For example, the subfamily Sininae has priority over Naticidae. The previous code would have required that Sinidae be used in place of Naticidae (which was ignored because it was inconvenient); the new code requires the name Naticidae to be maintained.

Other salutary changes affect proposals of new names, and manner of lectotype designations.

4) A new name published after 1999 must be explicitly indicated as being new, by use of a term such as "sp. nov." or "new species," otherwise it is not available (Article 16.1). This rule prevents the introduction of names in ways that makes it unclear that they are new, and prevents new taxa from being named accidentally, for example, by unwitting use of a manuscript name.

5) The proposal of a new species or subspecies after 1999 must include the fixation of a holotype or syntypes. If the holotype or syn-

types are extant specimens (e.g., not lost or destroyed in the process of describing them), there must also be a statement of intent that they will be or have been deposited in a collection and a statement of the name and location of that collection. It is recommended that a holotype rather than syntypes be designated, and that authors deposit type specimens in an institution that maintains an accessible research collection. (Article 16.4.)

6) Lectotype designations made after 1999 must include the term "lectotype" or an exact translation of it; provide a means to recognize the designated specimen; and contain a statement of the taxonomic purpose of the designation (Article 74.7). A lectotype is a specimen chosen by a subsequent author from the original type material (the syntypes), in cases where the original author did not designate a single specimen as the holotype. The previous edition of the code allowed lectotype designations by "inference of holotype," in which an author illustrated a specimen as the "holotype" when it was merely a syntype. Even professional malacologists have often made this mistake, partly because the labeling and organization of many museum collections can be misleading. The new code also clarifies that the simple inference of a holotype before 2000 is not a lectotype designation if the original description makes it clear that there was more than one type specimen (Article 74.5).

The foregoing changes in the Code I think make it clearer and more rigorous. I fear, however, that one change will cause problems.

7) A work produced after 1999 by a method other than printing on paper is accepted as published if it contains a statement that identical copies have been placed in at least five major publicly accessible libraries named in the work itself (Article 8.6). This means that CD-ROM is an acceptable means of publishing. The problem is that special technology is required to read a CD-ROM, or DVD disk, or other media yet to be invented. Disk drives that can read a CD-ROM might be extremely rare fifty years from now, and software that can read the file format used might be virtually unobtainable.

For further information on the ICZN and the new edition of the Code, see <<http://www.iczn.org>>. The 4th edition of the *International Code of Zoological Nomenclature* is available for £40 or \$65 from either of the following:

International Trust for Zoological Nomenclature

c/o The Natural History Museum
Cromwell Road
London SW7 5BD
United Kingdom
(e-mail: iczn@nhm.ac.uk)

or

American Association for Zoological Nomenclature

Attn. D.G. Smith, MRC-159
National Museum of Natural History
Washington, D.C. 20560-0159, U.S.A.
(e-mail: smithd@nmnh.si.edu)

A 25% discount (to £30 or \$48) is available to students and individual members of a scientific society ordering one copy for personal use; the name and address of the student's supervisor or of the society should be given. Prices include surface postage; for airmail add £2 or \$3 per copy.

Payment should accompany orders. Checks should be made out to "ITZN" (sterling or dollars) or to "AAZN" (dollars only). Payment to ITZN (but not to AAZN) can also be made by credit card (Visa or MasterCard only) giving the cardholder's number, name and address and the expiry date.

Department of Malacology, The Academy of Natural Sciences of Philadelphia, 1900 Benjamin Franklin Parkway, Philadelphia PA 19103-1195 rosenberg@acnatsci.org

Wes Thorsson, editor of the online *Hawaiian Shell News* announces that CD-ROM's with all issues of IHSN from January, 1997 to December, 1999 with an index. \$12.00 in U.S. and \$15.00 by air to Non-U.S. addresses. Contact Wes at 122 Waialeale St, Honolulu, HI 96825-2020, U.S.A <thorsson@hits.net>

Jim Miller is doing a video on great shelling spots in north Florida. He isn't in production yet, being busy shooting footage for the project, but watch for an announcement in an upcoming issue. And look for a Jim Miller photograph on the June cover.

Book Reviews:

A conchological iconography [volume(?) 2] The family Strombidae by Kurt Kreipl and Guido T. Poppe. ConchBooks, Hackenheim, Germany. pp. 1-60 with numerous b&w text figures + 130 color plates. 210 x 295 mm. Loose-leaf, four perforations, dedicated binder available. ISBN 3-925919-27-9 (masterwork); 3-925919-29-5 [this volume(?)], 1999; with reference to [volume(?) 1] *The family Harpidae*. See reviews of volume(?) 1 *The family Harpidae* of this masterwork by Patty Jansen and by Richard E. Petit [American Conchologist 27(2):30; 30-31. Sept., 1999].

As I witness the evolution of this ongoing publication, arguably a renaissance of the traditional 19th century serial iconographies and now in its second issue, I am immediately drawn to the profusion and excellence of the illustrations (attributed to Guido Poppe and various collaborators), especially the color images, which are deployed on a black background, single-side, full page format. The images are crisp and otherwise hi-fi; the specimens outstanding. The plates are well-organized, and the captions reasonably accurate. Thus far, and I suspect for the perpetuity of this series, the pictures are the focus and strength of the masterwork.

The general poverty of text has been cited by earlier reviewers, but I see an evolutionary trend toward more meaningful treatment of constituent species, especially from the standpoint of identification guidance. The Strombidae are nicely iterated in generic, subgeneric, and specific sequence, first in tabular format, then with descriptive text including entries for range, size, description, and remarks – most helpful is the juxtaposition of a fine b&w image of the shell to the text. This emphasis is a welcome improvement over volume(?) 1 *The Harpidae*. Somewhat dismaying is the failure to arrange species-level taxa in consistent alphabetical order.

Like volume(?) 1, the work does not include diagnoses of generic-level taxa, and offers only the briefest treatment of general biological, paleontological, and historical aspects. Likewise it offers only summary nomenclatorial data (generally lacking are synonymies and citations to taxonomic literature). The bibliography is a bit more extensive and better edited, but far from exhaustive, lacking **any** work over 39 years old, let alone Dillwyn (1817) and Lightfoot (1786); see below. The index is quite serviceable. The pagination does NOT include the 130 color plates [unlike volume(?) 1]. Family names continue to appear consistently in boldface, a convention I hadn't encountered previously, but authorship parentheses (denoting generic reassignment after original nomination) are employed; this convention was scrupulously avoided in volume(?) 1. Leo Man in't Veld contributed a minichapter (in a somewhat personal style) on the taxonomic position of *Strombus listeri* (page 55).

Numerous spelling errors and occasionally stilted English notwithstanding, the text of the second issue is quite readable, and the scientific editing appears to have improved (no gender-bending *Morum amabilis* [sic] and *M. strombiformis* [sic], and the parentheses matter mentioned above is fairly well-remedied). Some technical and identification errors warrant mention: in volume(?) 1 there are two text plate 6's. Color plate 35 fig. 6 (two views) and color plate 36, fig. 6 (2 views) are *Morum uchiyamai* and *M. grande* respectively, not vice-versa as captioned. The faux *M. u.* is recapitulated in the otherwise marvelous

kaleidoscopic composite on color plate 48. In volume(?) 2 the tabulation of species includes the proper attribution of *Lambis truncata truncata* to Lightfoot, 1786 [sic; parens improperly omitted]; Dillwyn (1817; vol II, p. 659) miscredited *Strombus truncata*, mentioned first in the *Portland Catalog*, to Humphreys [sic], and nearly all subsequent authors have perpetuated the error. Regrettably and inexplicably, in the ensuing treatment of *L. t. t.* in volume(?) 2, credit relapses to Humphrey. *Strombus sinuatus* and *S. tricornis* are consistently misattributed to Humphrey through the same Dillwyn (*ibid.*, pp. 662- 3) machination. *Rimella* was erected by Agassiz in 1840; not "Röding, 1798." *Strombus microurceus* Kira, 1959 and *S. pipus* Röding, 1798 need rehabilitative parentheses. On color plate 7, figure 2 (3 views) looks like a form of *Rimella cancellata* (Lamarck, 1816) seen in several parts of its range rather than *R. tyleri* H. and A. Adams, 1863 as captioned. *Lambis chiragra chiragra* form *rugosa* (G. B. Sowerby I, 1842) is erroneously assigned to *L. c. arthritica* on color plates 27 and 28. A colleague of mine, more familiar with the family, pointed out a few other misidentifications and will publish his findings elsewhere.

Although not a concern to most readers, the overall organization of, and somewhat byzantine array of contributors to, *A conchological iconography* poses a challenge to bibliographers. My first step, and I lay no claim to infallibility here, is to treat the work as a **journal** with Guido Poppe and Klaus Groh the editors, rather than a **book** (ISBN should be an ISSN?). The authorship of the **text** should be considered the author of each **volume** (I shall hereafter omit the "?" by which astute readers may have been distracted in the text above), i.e. "Dance, S. P. and G. T. Poppe, 1999. The family Harpidae. *A conchological iconography* 1: 1-69." The vignette by Poppe and Brulet in *A conchological iconography* 1, and the polemic/taxonomic note by in't Veld in volume 2 can be cited as "Poppe and Brulet in Dance and Poppe", and "in't Veld in Kreipl and Poppe," etc. The production of the plates (Guido T. Poppe and Thierry Brulet for volume 1; Poppe, Leo Man in't Veld, and Koenraad de Turck for volume 2), although of paramount value, need not be cited for bibliographic purposes; the author(s) of the text should be considered accountable for the plate captions.

The long and short of it: long on illustration; short on text. These two volumes perform a task admirably; they summarily depict, beautifully and with sufficient accuracy, the Recent fauna of two popular groups of Recent marine gastropods. The price is high, but the quality is worth it. Perhaps a leaner approach to the illustrations with, say, 30-40% fewer images per species might reduce costs commensurate with a significantly more affordable price tag yet with minimal loss of value to the user. Two caveats; one: once armed with this iconography, don't consider for a moment any serious immersion into these groups of mollusks without beefing up your library with the scientific monographs that are the necessary underpinnings of a more thorough understanding of their natural history. Two: ignore the bargain prices advertised in the order form positioned behind p. 60, at the end of my copy of volume 2; they're simply too good to be true.

Volume 2 is available from several U. S. dealers at \$70.00; volume 1 at \$45.00; special binder (commodious enough to store about three volumes but below the standard of *Indo-Pacific Mollusca*) at \$13.00. Future volumes are expected soon; topics include the Ficidae, Acavidae (in part), *Calliostoma*, Neritidae, etc., and I anticipate these works with gusto. European customers may wish to contact the publisher, ConchBooks, Mainzer Str. 25, D-55546, Hackheim, Germany. <http://www.conchbooks.de>.

—Harry G. Lee

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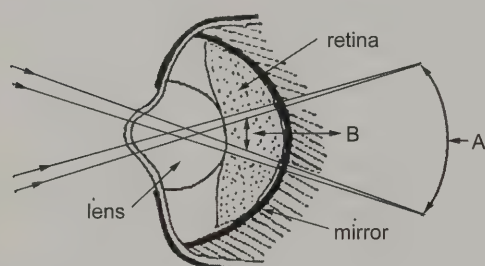
Old Blue Eyes and Kin

By John Cramer

The mollusks exceed all other groups of animals in their variety of types of eyes. Only the arthropods rival mollusks in the number of light sensing organs and structures displayed by species in the phylum. Insect eyes, as marvelous as they are, are far more alike than are the eyes of mollusks and, while the vertebrate eye is a wonderful device, it is pretty much the same from sharks to hawks to humans. Although the best-studied invertebrate eyes belong to the horseshoe crab *Limulus*, the sea hare *Aplysia* runs a close second, primarily because its optic nerves are so accessible.

Of the eight classes of mollusks four have no known light sensing capability. Like shellers, biologists have expended relatively little time on the non-shellbearing Aplacophorans and Caudofoveates and their light sensing abilities have not been explored so far as I know. Of the shell bearing classes, the gastropods (class Monoplacophora), long thought extinct, also have not been studied. The more familiar tusk shells (Scaphopods) have fared no better. None of the members of these four classes have obvious eyes. It seems plausible they might at least have dermal sensitivity to light, but there is no information available on the subject to my knowledge. Thus, fully half of the molluscan classes are not known to have any sensitivity to light.

Happily, the eyes in the remaining four molluscan classes are tremendously diverse. Many unsolved mysteries remain in this area. Let's take a look.



Mirror eye of *Pecten*: the lens forms an image at A which the mirror turns into an image in the retina at B.

Mirror Eyes

Most of us are familiar with the beautiful ring of blue eyes that look out from the rim of a scallop's shell. Euell Gibbons honored them in the title of his book *Stalking the Blue-Eyed Scallop*. Found in limas as well as scallops, these eyes are based on mirrors, much like modern telescopes. In the camera-like vertebrate eye, light entering the eye is focussed at the front by the cornea and lens onto the light-sensing retina at the back. In contrast, scallops have a lens at the front of the eye, a curved mirror (argentea) at the back of the eye and a small retina in between the lens and the mirror. This type of arrangement now has the intimidating name "corrected catadioptric camera" but it is much older than the name. Doubtless scallops have had such eyes since there were scallops. These blue eyes are truly old.

The lens is a recurved Huygensian correcting lens. That is, it is a thick lens with a doubly curved front surface, round in the center, then turning and flaring out. As in our own eyes, an iris controls the amount of entering light. Light passing through the lens next strikes the mirror at the back of the eye. This mirror is made of uniformly spaced and

neatly stacked crystals of guanine which act like thin films of oil on water, reflecting back only certain wavelengths of light that interfere constructively with each other. The reflected light is focussed onto a pair of retinal surfaces between the lens and the mirror. One of the surfaces registers "light on" and the other, "light off." There is no retinal image because light passes through the retina twice, once going in and once going out!

Despite the simplicity of the image, these eyes are useful to the scallop. Remember, each scallop has a large number of these eyes. The combination is excellent for detecting the moving shadows of predators. Because the information is digital (binary code), these eyes have a high signal-to-noise ratio—they discriminate well. And they have fast optics, up to an f-stop of 0.6!

Why are they blue? It's probably a simple matter of light interference. The argentea mirror reflects different wavelengths at different angles because it relies on light interference to do its job of reflecting. Such a mirror can focus one wavelength (color) of light perfectly. If it focuses yellow-orange light well, blue light will entirely miss the retina and will pass through the lens and out of the eye. The overall effect would be a blue eye.

Variations on the scallop eye appear in the file shells (*Lima*), which have smaller reflecting eyes and in the cockles (*Cardium*), which have very small reflecting cups around their siphons. Apparently, little work has been done on *Cardium* eyes and some experts express doubt of their image forming capabilities. Presumably, they can at least detect changes in light intensity and, hence, detect the presence of predators. By contrast, scallops can detect the movement of a pattern of stripes. Since the movement produces no change in overall light intensity, the scallop eyes must be responding to the movement of the total pattern and must, therefore, be able to see details of the external world with some precision.

Compound Eyes

Compound eyes are common in the invertebrate world but only one molluscan family has them. Like scallops, ark shells (*Barbatia*) have eyes at the mantle edge. These eyes are about one fifth of the (1 mm diameter) size of scallop eyes. Examining them with a microscope, one can see they are composed of numerous even smaller eyes, 10 to 80 per eyespot. Each "ommatidia" is a single cell with a slightly domed, transparent outer surface acting as a lens and a receptor on the other end of the cell. Each ark has more than one hundred of these eyespots around its mantle. Such eyes in such numbers apparently allow the arks to see approaching predators before they can get close enough to cast a shadow.

Shadowing Response and Dermal Sensitivity

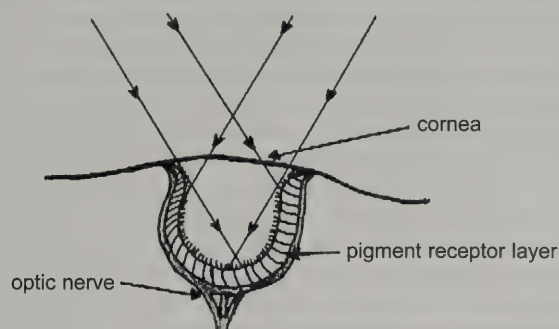
Another type of light sensing, dermal sensitivity, occurs in most bivalves and snails. This is purely shadow detection equipment and almost nothing is known about the structures that carry it out. Most of the information available on the subject comes from behavioral studies of the sensitivity of the system. For example, the real eyes (cephalic eyes) of the snail *Helix* do not respond when a shadow falls on them. But, let a shadow cross the mantle near the base of the shell and the animal withdraws into its shell. Most clams close up when a shadow falls on them. In *Spisula* and *Mercenaria*, the pallial nerve is known to be involved in this response but the receptors are not known.

The shadowing response in mollusks is almost always an "off" response. That means the animal gets a signal when light intensity drops, not when it increases. The "off" surfaces in scallop retinas are probably related to this shadowing response. The "on" surfaces of scallop retinas signal an increase in light intensity and they are structurally different from "off" receptors.

Some snails also detect light in ways that are poorly understood with light receptors that are unknown. We have already noted the shad-

owing response in *Helix*. In this regard, *Helix* is typical of snails generally but in most cases we do not know how they do it.

Related to the shadowing response, the only known non-cephalic eyes in snails occur in members of the genus *Onchidium*. These snails have some 20 to 50 small eyes (0.1 to 0.2 mm in diameter) in papillae on their "backs." These eyes seem to be the receptors mediating the shadowing response in these animals but most snails are not known to have such eyes.



Pigment-eye cup eye: The "cornea" has no real focussing ability. It may not even be present and, when it is present it is merely an eye covering.

Pigment-cup Eyes

The eyes of *Onchidium* are very simple cups lined with receptors. These have been called "pigment-cup eyes." Pigment-cup eyes have no lenses or even covers that could act as lenses. Similar eyes appear in the chitons (class Polyplacophora). Like the night, the chitons have a thousand eyes (or more)! Unique among mollusks (in fact, among all animals), chitons actually have eyes in the top of their shells! A single chiton may have as many as 11,000 eyes in its shell. That comes to more than one thousand per each of their eight shelly plates! Furthermore, the chitons have two distinctly different eyes, pigment-cups and aesthetes. The pigment-cups here are covered by clear, flat covers that have no focusing function. With about 100 retinal cells in the cup, the whole cup eye is no more than about 0.04 mm across! The aesthetes are small areas consisting of only a few receptor cells, possibly only one cell.

If you have a chiton in your collection, you can check this out yourself. My little hand-held 30x illuminated microscope from Radio Shack is good enough for seeing at least some of these eyes in the Fuzzy Chiton (*Acanthopleura granulata*). The rounded plates make viewing difficult and it is hard to know just what part of the plate is in view. Just look all over the plate. You'll find places with dark spots and smaller holes. The dark spots seem to be just areas of pigment, and the small holes, the cup eyes. The aesthetes are too small to see at low magnification.

Little is known about the function of chiton eyes. Chitons are known to respond to shadowing and to move in response to changes in light intensity (phototaxis). It is tempting to speculate that the cup eyes mediate the phototaxis and the aesthetes the shadowing response but this has not been established experimentally. It is known that the cup design provides the modest direction sensitivity required for phototaxis and there is general agreement they might mediate the shadowing response. Just how chitons actually use them is a different matter.

Some limpets, *Haliotis* and particularly *Nautilus*, have maximized the pigment-cup structure, almost closing the cup, making it into a pin-hole camera. This has improved visual acuity at the expense of light gathering. Thus, the eyes of limpets, abalones and nautilus form fairly sharp but dim images.

Cephalic Eyes

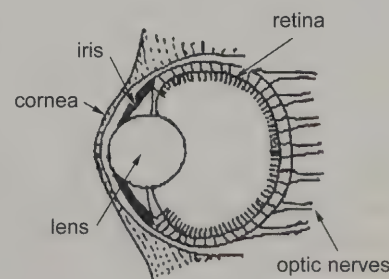
With perhaps just one exception, the cephalic eyes of snails and cephalopods are molluscan eyes we can relate to. They are in the head (hence "cephalic") and paired like our eyes. They look like eyes in two senses: they appear to be like our eyes and they function like our eyes. The exception is the cephalic eye of the pigment-cup type found in the blue mussel *Mytilus edulis* (but who can say where the head of a mussel is anyway?).

Appearances to the contrary, molluscan cephalic eyes are unlike our own in fundamental ways. For one thing, mollusks do not see color, which makes a puzzle of their often very colorful shells and flesh. No mollusk eyes have anything like the color sensing cones of the vertebrate eye. These eyes are also wired differently, with the optical ganglia behind the eye in the "sensible" position, unlike the ganglia of the vertebrate eye which are on the inner surface of the retina. We are only able to see because our optical ganglia are transparent. Since there is no need to get the nerves through the retina to the brain, the cephalic eyes of invertebrates lack the "blind spot" of all vertebrate eyes.

The most important difference lies in the lensing of the eyes. Like us, mollusks are mainly water and their eyes are mainly water. Now, a lens made mostly of water will do a fine job focusing light coming into it from air. But the same lens is almost worthless under water. If you have a clear, plastic, magnifying lens, try it underwater. It may turn into a diverging lens in water! The organic material of the eye would focus light better than the liquid (mostly water) part so the eye might focus light but it would have to be very large to get the retina back where the image would form. Huge eyes are not practical so the mollusks have opted for spherical lenses because they have the shortest focal length. However, spherical lenses are notorious for "spherical aberration" where light entering the middle of the lens is focused closer to the lens than light falling on the edge of the lens. Ordinarily, spherical lenses form crummy images.

The mollusks are, of course, not alone in this difficulty. Any animal that wants to see well in water has the same problem. Thus, fish, mollusks, polychaete worms, copepods, and certain spiders all have the same type of eye lens called a Matthiessen lens after the man who first explained how and why it worked. What all these animals have done is to make an eye in which there is more organic material in the middle of the lens than at the edge. The distribution of material is beautifully controlled so that all the light falling on the lens focuses at the same point. In more technical language, the optical density (refractive index) of the lens material is inhomogeneous and varies radially with a mathematically defined gradient that completely eliminates spherical aberration. The optimal solution is that the focal distance should be exactly 2.5x the radius of the lens. All animals that see well in water have Matthiessen lenses. This marvelous engineering trick has been in use for perhaps half a billion years. Only in the last few decades have we humans become able to even approximate this difficult fabrication feat.

The Matthiessen lens has one serious drawback, chromatic aberration. Different colors focus at different points, making the image a smear of color. Thus, the eye can perfectly focus only one color one wavelength, of light. Wavelengths close to the optimal one will



Cephalic Eye With Matthiessen Lens

focus reasonably well but the rest will focus poorly. Thus, the Matthiessen eye is essentially monochromatic. We need not expect color vision in aquatic animals.

The cephalic eyes of snails are usually lensed eyes which focus images on the retina. Exceptions occur. Lensless, spherical pigment-cup eyes occur in the limpets and abalones and the land snail *Helix*. In the limpets and abalones, the eyes function as pinhole cameras. The eyes of *Helix* lie beneath the epithelium and seem to have little image forming ability. The lenses of lensed eyes must be Matthiessen lenses for all marine and freshwater snails. Some of these eyes are quite large and obvious so they are easy to study. No need of an electron microscope here; in most cases a hand lens will do fine. Think of the large eyes of the Queen Conch, *Strombus gigas*, for example. In fact, the strombids are notable for their unusually large eyes. No one understands why these herbivores need such good eyes.

Periwinkles of the genus *Littorina* do not have Matthiessen lenses because they only use their cephalic eyes in air where the optical contrast between air and fluids in the eye make focussing comparatively easy. They cannot see in water, of course, but apparently they are satisfied with the exchange. In this respect, it is interesting to note that, despite their ability to make calcite crystals for their shells, no mollusks have gone the route of the ancient trilobites. Trilobites solved the underwater lens problem by making lenses of pure, clear calcite! Obviously, all land snails are free of the problems of seeing in water but not all of them have lensed eyes. Some, like *Helix*, prefer the pigment-cup eye.

Their relatively large size is an important feature of cephalic eyes. Of course, a Matthiessen eye must have a retina separated 2.5x the lens radius from the center of the lens. But the lens might be very small and the eye also small. Large eyes make for improved visual acuity which, in turn, makes for improved food finding, detection of approaching predators, and survival generally. Larger eyes form larger images and, since retinal detectors are biological cells with a more or less invariant size, the larger image means more retinal detectors will be activated. In computer language, the image will be spread over more pixels and the image resolution will improve. M.F. Land found an angular resolution range of from about 0.2° to 4.4° in a number of snail species. The worst resolution occurs in the smallest eyes. By way of comparison, the compound eye of the ark shell, which is diffraction limited, is 10. For scallops, the figure is 2° .

Some of the best visual acuity occurs in the heteropod snails. Land studied live specimens of *Oxygyrus keraudreini* and was astonished to find a most peculiar retina in these animals. Most cephalic eyes have a more or less hemispherical retina. In the heteropods, the retina is a thin strip 3 to 6 cells wide but several hundred cells long. It may be flat or curved depending on the genus or species. The animal, thus, has a narrow field of view, about 3.2° , by 160° .

The animal uses this eye in an unusual way. The eye swings about an axis through the lens parallel to the retina in a constant scanning motion. Starting from the horizontal position, it sweeps downward at about 250° per second and then returns more slowly at about 80° per second. Land conjectured that the snail, a pelagic predator, is looking for food objects brighter than the abyssal dark beneath it. So snails discovered TV scanning several hundred million years ahead of us. Perhaps snails are not so slow after all!

The best eyes in the invertebrate world belong to cephalopods. It is not just a matter of the structure and resolution of the eyes but also of the musculature and control of eye movements. Cephalopods, like vertebrates (and hoverflies), can keep their eyes directed at the same point in space as they move about. These movements require at least 6 eye

muscles. Fish and octopi have 6 but there are reports that cuttlefish, *Sepia*, have 13! There are also reports that octopi can track a small moving object. Such eye movement is rare and has long been regarded as exclusively confined to the primates, even among the vertebrates. Cephalopods are also apparently unique among invertebrates in that they detect and react to a pattern of wide stripes rotating around them. This type of optomotor response has not been found in other mollusks. The good-to-excellent acuity of cephalopod eyes is due to several factors. Most importantly, the eyes are large. Also, retinal cells are long and narrow so they can be more densely packed – more pixels per square inch. Each eye typically has several million receptors. By comparison, our eyes have about one hundred million receptors. The giant squid, *Architeuthis*, has the largest eye known, about 16 inches in diameter, and should then have about ten billion receptors in its eyes. Land found the resolution of the octopus eye to be around 0.02° . It would be much better for the giant squid.

Cephalopods are also able to detect the polarization of light coming to them. The microvilli responsible for detecting light in the retinal cells are arranged in long, parallel fingers that respond better to light polarized with its electric field directed along them. This is helpful because many of their prey fish are silvery-sided. The fish reflect the ambient light and thus, to our eyes, blend into their background. The image of the fish has almost the same intensity as the background light so the fish are essentially invisible. No contrast. Not to the polarization sensitive eye, however. All reflected light is polarized to a degree and, when polarization is taken into account, the image of light reflected from the fish looks different from the background. The fish contrasts with the background and is visible.

The great curio of the family of cephalopod eyes is found in *Nautilus*. The eyes of *Nautilus* have all the musculature, movement, and retinal advantages of other cephalopod eyes. For utterly mysterious reasons, the structure of the eye is a miserable throwback (so to speak) to the eyes of abalones and limpets! In fact, abalones have better eye structure in that they at least have a cover or cornea over the pit eye. In *Nautilus*, the eye is an empty chamber open to the sea! The moveable pupil is merely a pinhole for the pinhole camera eye. The entire eye is compressed laterally, no nice spherical chamber here. When the pupil is at its smallest size (0.4 mm) this eye will have its best resolution of about 2.3° , 100 times worse than in octopuses and no better than most snails, for all the improved musculature and retina. Even at this setting, light from a point on a viewed object will fall on about 2500 receptor cells! Of course, at the smallest pupil size, the image will be very dim, about 400x times dimmer than for an octopus. Almost any transparent cover over the eye would improve matters a bit. Why *Nautilus* has retained this unsatisfactory eye for a half million years is, as Land has said, a "tricky evolutionary problem."

One genus of squid, *Histioteuthis*, has an unpaired pair of eyes. One of the two cephalic eyes is of normal spherical shape with the spherical lens bulging out from the body. The other is tubular, the spherical lens protruding from a somewhat conical tube which, in turn, protrudes from the body. The squids swim with the tubular eye pointing up. Why? Who knows? One last curio: the pupils of in-shore cephalopods, *Octopus* and *Sepia* for example, are often W-shaped while those of off-shore species are round. Again, no one knows why.

John's article originally appeared in six parts in the Georgia Shell Club newsletter, The Whelk Wavelength in this order: Part 1. - Nov. 1996, Part 2 - Jan. 1997, Part 3 - Feb. 1997, Part 4 - Mar. 1997 (and the April too, by accident), Part 5. - Jan. 1998, and Part 6. - Feb. 1998.

THE OLD SHELL GAME

A SOUND METHOD FOR CLEANING SHELLS

by Paul R. Monfils

Cleaning shells is one of those necessary evils which seem to be part and parcel of virtually any worthwhile human endeavor. I haven't met a collector yet who claims to revel in the task—yet it is frequently the topic of presentations at shell club meetings, articles in conchological publications, and postings to computer discussion groups.

The term "cleaning," as it applies to shells, involves a wide range of objectives, including the removal of: (1) soft tissues of the mollusc from the shell's interior; (2) silt, mud, or other debris accumulated from the environment; (3) encrusting growths of other organisms, including algae, bryozoans, barnacles, coral, tube worms, and sometimes even other molluscs; (4) the natural fibrous covering, or periostracum, which many molluscs secrete over the shell surface; (5) various foreign substances, such as glue, ink, oil, silicone, or lacquer, which have previously been applied to the shell. Such a multiplicity of goals, combined with the seemingly endless variety of size, shape, texture, sculpture, and fragility of the shells themselves, assures that no single technique will adequately and safely clean all specimens.

The standard practice of soaking in a bucket of cleaning solution, followed by a fresh water rinse, and perhaps a bit of physical picking with a sharp instrument, produces good results for perhaps ninety percent of the shells we encounter. However, some perplexing problems may arise in dealing with the remaining ten percent. Some specimens are too small or too thin and fragile to be handled in the usual fashion. Others are sculptured with deep recesses, ridges, or hollow projections that entrap particles of sediment. Some shells possess a velvety or bristly periostracum which the collector may not wish to remove, but which is infiltrated with silt, and always looks dirty. Then, there are fragile opercula which won't stand up to chemical solutions; bivalves that have been glued shut for safe shipping; ink markings from a previous owner; the specimen you oiled, then wished you hadn't. The list goes on and on. Many such problems are quickly and easily resolved by the use of a small tabletop appliance known as an ultrasonic cleaner, the most versatile tool in my small arsenal of shell-cleaning paraphernalia.

An ultrasonic cleaner (alternatively known as a "sonicator," and hereinafter referred to as UC) is essentially a tub of liquid, with an attached electronic device called a transducer, which generates high frequency sound waves and directs them into the liquid. As the waves pass silently through the solution, they produce an effect known as cavitation, the rapid formation and instantaneous collapse of microscopic spaces throughout the liquid. These cavities are not "bubbles" in the usual sense. Bubbles are typically filled with air or some other gas, and rise to the surface of a liquid. Cavitation spaces contain nothing. They simply pop open, exist for a millisecond or so, slam shut, and are gone. The effect of this process, repeated millions of times per second, is a vigorous, yet extremely gentle, "scrubbing" action over every surface exposed to the liquid. The cleaning action penetrates effectively into tiny pits, reticulations and furrows, rooting out even microscopic particles of mud and silt that could not be reached any other way.

And yet the action is so gentle that the most delicate of shells can be cleaned thoroughly and safely—IF they are in good physical condition. The very few occasions when a shell has fractured in the UC involved an extremely thin and fragile specimen (*Haminoea*, *Akera*, *Oxyloma*, *Philine*, etc.) which had a hairline crack before immersion. In such cases, the fluid flows into the defect, and the subsequent cavitation action within the crack may force it open, breaking the shell—

or, to be more precise, exacerbating the pre-existing break. Other than a few regrettable experiences with such delicate, translucent specimens, I have never seen a shell damaged in the UC, after cleaning many thousands of specimens in this manner.

Specimens bristling with fine spines, like *Spondylus linguaefelis* or *Latiaxis echinatus*, are stripped of every particle of sand and silt, without injuring a single spine. Likewise, the UC will remove every speck of dirt and debris from the most bristly or lamellose periostracum, without detaching the periostracum from the shell. Finely ridged or deeply sculptured opercula clean up beautifully, without exposure to harsh chemicals. Oil, silicone, and other non-hardening coatings are removed almost instantly. Dried substances like ink and lacquer require a longer exposure. The UC works well with nothing but clean water in the tank, but I prefer to add a couple of drops of liquid dish detergent per quart of water. Avoid commercial ultrasonic cleaning solutions. They are designed for degreasing metal and other tough industrial applications, and are unnecessarily harsh for use on shells. You would be amazed at the amount of suspended dirt sometimes present in the solution after cleaning a dozen shells you thought were already clean!

The UC is invaluable for cleaning shells that are too small to handle by more conventional methods, but here some special techniques are useful. Tiny shells, simply dropped into the UC, tend to zip around the bottom of the tub, risking possible damage from impact with other shells. In a high speed collision between a *Marginella* and a *Haminoea*, the *Haminoea* will be the loser! However, sound passes readily through solid materials (as you realize if you have ever had uncivilized neighbors in the next apartment). Therefore small shells can be placed in water-filled vials or small plastic boxes, which are subsequently submerged in the UC. Very delicate items can be loosely wrapped in cotton or polyfill before placement in the smaller containers, further restricting their freedom of motion, and shielding them from any possible impact. The cleaning action will occur within the submerged vials at nearly the same intensity as outside them.

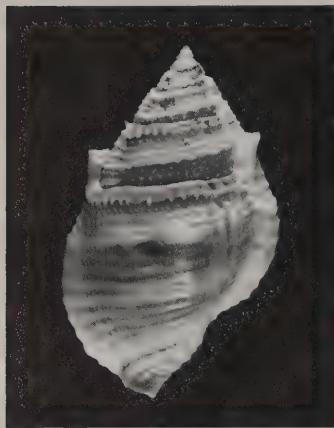
The UC is capable of removing, or at least loosening, most types of glue. This ability comes in handy in several ways. I frequently receive shells with poorly mounted opercula (sometimes inside out!), and wish to remount them on fresh cotton. Removing the old glue and adherent dirty cotton from the back of an operc can be quite difficult, especially if the operculum is fragile—unless you have a UC. Within a short time, the adherent material either falls off the operculum, or at least is softened to the point where it can easily be peeled off. And the operc itself is thoroughly cleaned in the process! Some commercial suppliers glue the valves of a bivalve shell, so they won't rattle against each other and chip during shipment. They can usually be separated by a lengthy soak in soapy water or bleach, but the UC does the job much faster, and removes all traces of the glue from the hinge teeth and other internal sculpture. I have also found an interesting application with carrier shells (*Xenophora*). Some suppliers "enhance" the appearance of specimens by gluing on additional attachments. When done sloppily this is obvious, but when done carefully it can be difficult to detect. The UC loosens the glue, causing artificially attached items to fall off, but doesn't remove those attachments selected by the original inhabitant of the shell.

The UC is not useful for removing the soft parts of a freshly collected specimen. Cooking or freezing are still required for that purpose. It will not remove heavy calcareous encrustations like coral, barnacles, tube worms, or heavy "lime" deposits, though in some cases it may loosen them a bit, making them easier to pick off manually. Unfortunately, you are not likely to find a UC at the average hardware store. Larger jewelry stores may offer a low-powered unit with a capacity of about one cup, designed for cleaning jewelry. In a large city phone book you may find a listing or two under "Ultrasonic

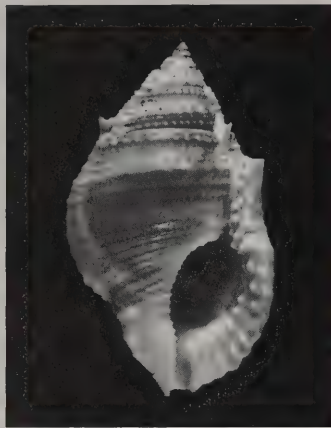
(Continued on page 30)

BURSIDAE and PERSONIDAE of the Western Atlantic

by Kevan and Linda Sunderland



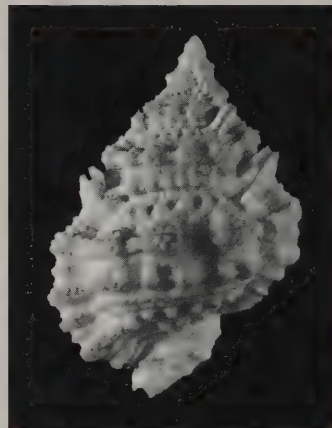
Bufonaria bufo (Bruguière, 1792). 65 mm. 20 m., by shrimper off Punta Petuca, Honduras.



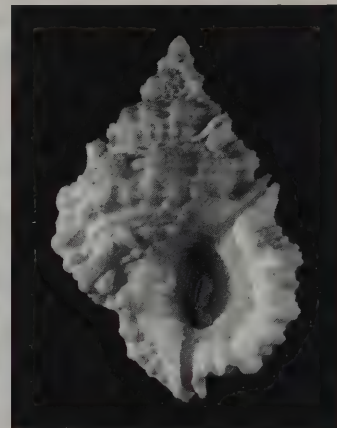
Bursa corrugata (G. Perry, 1811). 75 mm. 5', in heavy reef at night, Sombrero Reef, Florida Keys.



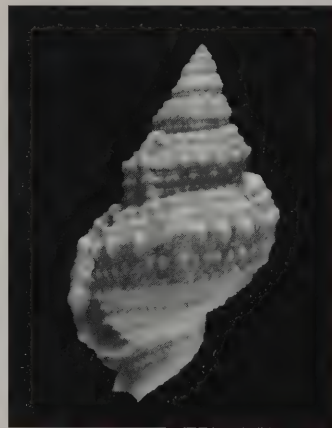
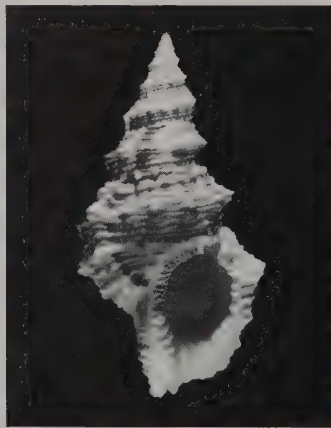
Bursa granularis (Röding, 1798). 57 mm. 8', in reef, Grand Bahama Island. ex Bob Quigley Collection



Bursa grayana Dunker, 1862. 45 mm. 15-20 m., in reef off Barra Salvador, Bahia State, Brazil.



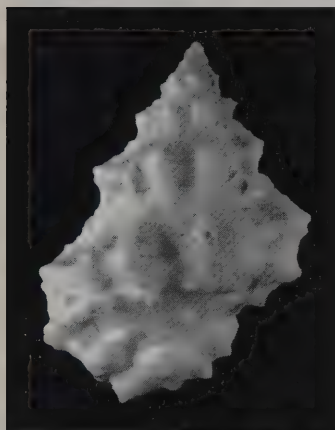
Bursa natalensis Coelho & Matthews, 1970. 97.3 mm. 150 fms., taken dead in traps, South Shore, Castle Harbour, Bermuda.



Bursa ranelloides tenuisculpta Dautzenberg & Fischer, 1906. 52 mm. 170 fms., by shrimper, off south side of Key West, FL.



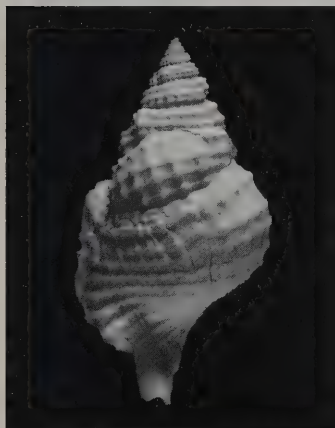
The intent of this feature is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not always popularly available, for the information of the collector.



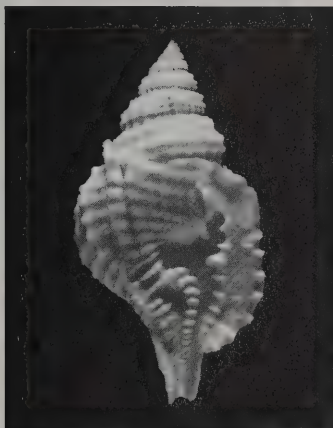
Bursa thomae (d'Orbigny, 1842). 36 mm. 60' in reef, off Pickles Reef, Key Largo, FL.



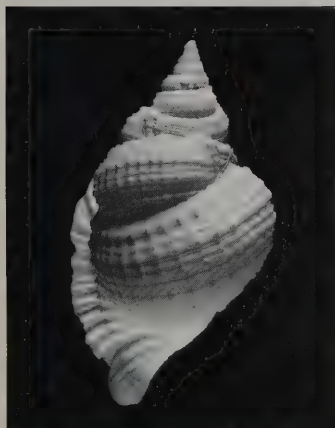
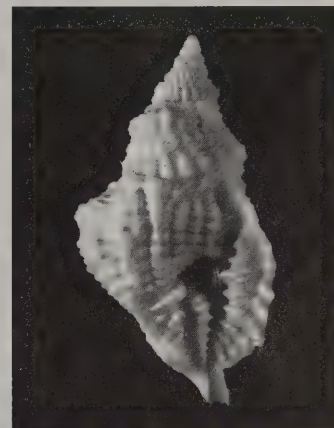
Distorsio clathrata (Lamarck, 1816). 78 mm. 240' by shrimp off Contoy Light, Gulf of Campeche, Mexico.



Distorsio constricta mcgintyi Emerson & Puffer, 1953. 52 mm. 240', by shrimp off south side of Key West, FL.



Distorsio perdistorta Fulton, 1938. 52 mm. 170 fms., by shrimp, off south side of Key West, FL.



Distorsio robinsoni Petuch, 1987. 78 mm. 35 m., by shrimp off Punta Petuca, Honduras.



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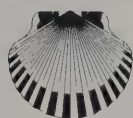
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Shells on the Internet

by Tom Eichhorst

Previously we discussed how to buy shells on the Internet using various Internet auction sites, as well as how to find images of shells that might help in a tricky identification problem. This time we will look at a few specialized sites. The first of these is the **Chiton Page** which is offered by Glenn and Laura Burghardt at <http://home.inreach.com/burghardt/>. Here you will find the best single source for chitons on the Internet — or anywhere else for that matter. The second site is Avril Bourquin's **Man and Mollusc** at <http://www.manandmollusc.net/>. This is a little gem of a site that is jam-packed with great information on mollusks. Any high school student would find a plethora of topics and information for science reports on this page. The last site is a scientifically oriented site presented by the Academy of Natural Sciences of Philadelphia, Malacology & Invertebrate Paleontology Department. This site is called **Malacolog 2.0** and is at gopher://erato.acnatsci.org/11/wasp. **Malacolog 2.0** is a database for research on the systematics, biogeography and diversity of Recent gastropods of the Western Atlantic, from Greenland to Antarctica.

Chiton Page

If you have even the slightest interest in chitons, Glenn and Laura Burghardt's web page is a must, <http://home.inreach.com/burghardt/>. They have studied chitons for over 30 years and have written a small book, *A Collector's Guide to West Coast Chitons*, 45 pages, 80 color photos, published in 1969 (reprint 1997). This excellent book is still available on their web site. But the "Chiton Page" offers so much more. Glenn and Laura expanded the offerings of their book to include all areas of the globe for their web page. They have pages dedicated to "West Coast of the U.S. and Canada," "East Coast of the U.S. and Canada," "West Mexico," "Central America and South America," "Australia," "Europe, Asia and western Pacific," "Africa," "New Zealand," and just in case they missed something there is "other areas." Each of these pages offers an image and a short descriptive paragraph for each chiton covered. There are chitons of almost any color and they seem to come in sizes from just a few millimeters like the 12mm *Craspedochiton rubiginosus* (Swainson MS, Hutton, 1872) from New Zealand to our own giant, the 300mm *Cryptochiton stelleri* (von Middendorff, 1847). This monster is usually seen in collections as eight bleached white plates and is called the "gum-boot chiton" with a range from the Bering Sea to California. In life it looks like a red-dish, half-inflated football. To date, the "Australia" and the "other areas" pages are still under construction.

Aside from more armored pieces-of-eight than you will find in any other single source, there is also a page on preserving chiton specimens, a diagram of the many different parts of the chiton, and a glossary of terms. The section on preservation is critical to the first time collector, as countless amateurs have collected chitons, only to have a specimen end up in a dried up little ball. The Burghardts discuss several methods of field preparation and final preservation. Because chitons differ quite a bit from the typical seashell, both the diagram of the animal parts and the glossary are quite beneficial. Some of the images are a bit blurred and there are a few specimens without a size indicated, but Glenn says he is working on that.

Do not let these minor problems keep you away from this web page. This was obviously an immense undertaking and Glenn and Laura have constructed a superb and unique web page. If they did nothing else to this page, it would still stand on its own as a valuable addition to our understanding of these usually small, intricate, and fascinating creatures.

Man and Mollusc

Avril Bourquin calls this site, "Uses of Shell-Bearing Molluscs—Past, Present & Future," and it is well worth a visit at <http://www.manandmollusc.net/manandmollusc.html>. Avril's index includes only a few completed articles at present, but there are a number of planned articles for the future. The format is very simple and the layout is pretty much an informal outline. But don't let the simplicity of this site fool you. There is a lot of information here and the format is such that additional information is easily added.

The first article is the title article for the site, "Man and Mollusc." This article lists uses of mollusks: food, trade goods, medicinal uses, tools, art and architecture, religion, music and communication, personal adornment, industry, offshoots, miscellaneous, and shell collecting. Each of these topics is followed by a list of the shells used in that manner and a few explanatory words when needed. There is also a section on "great men of the mollusc world," a bibliography, and links to other shell related sites. The links include two similar articles. First there is "Molluscs and Man" by Amy Edwards at <http://museum.nhm.uga.edu/GSC/newsletr/JUN97.html> and there is "Of Molluscs and Men" by Pamela Clapp Hinkle at <http://www.mbl.edu/LABNOTES/7.3/cone.html>. The influence of the Edwards (of Conch-L fame) article is evident in Avril's lead article and is thus very similar. The Hinkle article is an interesting story of the ongoing study of cone toxins.

Avril has kept this site simple and informative and thus suitable to a beginning or young shell collector. Common names are the norm but they are usually followed by the appropriate scientific name. In this manner the section on food has "mussels" followed by "(Family Myidae)" or "whelks" followed by "(Family Buccinidae)" and "Pink (or Queen) Conch" followed by "(*Strombus gigas* Linné)." Of course there is always an argument against the use of common names but their use here is perfectly matched to the purpose of the site. Again, this is a site suitable for beginners. In fact, there is also a page with a basic version of the title article that is suitable for very young children or those with special needs. The language is simplified and Latin names are not used.

The other articles that have been written include "Amazing Molluscan Facts," and "Shell Collecting." Articles planned but as yet unwritten include: "Molluscan Taxonomy," "For Teachers," "Molluscs in Your Backyard," "Anatomy of Molluscs," "Life Cycle of Molluscs," "How to Name a New Species," "Molluscan Links," "Starting Your Own Shell Collection," "Malacology," and "Squid, Octopi and Other Tricksters." There is a request following many of these planned articles for an author.

This web page was designed and edited by Ross Mayhew and the list of contributors includes many recognizable names from COA and Conch-L. Avril's web page could easily become a "community project" that presents a wide range of information on mollusks at an introductory level. Authors are needed and it seems the subject matter is not limited to the present list of articles. So if you have ever had an urge to write about mollusks, here is your chance. I think a few more images would add to the interest of the page, but even so, this is an excellent site.

Malacolog 2.0

Our last site is **Malacolog 2.0** at gopher://erato.acnatsci.org/11/wasp. This site is presented by the Academy of Natural Sciences of Philadelphia, Malacology & Invertebrate Paleontology Department, the work of Dr. Gary Rosenberg, and contains a searchable database of over 9,000 names of gastropods found in the Western Atlantic from Greenland to Antarctica. Of the 9,000 names in the database, slightly less than half are regarded as valid species — the others are mostly synonyms with some misspellings, improper publications, misidentifications, etc. The importance of this site cannot be overstated. Any attempt at researching gastropods of this vast area will be far easier

Constance E. Boone Grants to Malacology

The annual Constance E. Boone Grants to Malacology provides up to \$1000 to qualified persons undertaking collection-based research on recent mollusks at the Houston Museum of Natural Science. The HMNS malacology collection contains over 48,000 catalogued lots (45,000 in our database) representing approximately 1.5 million specimens most of which are from the Gulf of Mexico. The museum also has one of the finest malacological research libraries in the country.

Awards will be made **only** to citizens or permanent residents of the Americas or to undergraduate and graduate students attending colleges/universities in the United States.

The Houston Conchology Society (HCS) Grants Committee judges applications. Awards will be announced on the first of June each year.

If a grant is awarded, the recipient **MUST** submit a summary of the project progress to the chairperson of the Grants Committee within one year of the award. This report should be at least one page in length, reporting positive and/or negative results. Recipients who do not comply with this stipulation will be asked to return the award.

Grant recipients are encouraged to submit a short paper concerning their research to the editor of the HCS' journal, the *Texas Conchologist*.

Questions? Email Dr. Wise: jwise@hmns.org

Around the Clubs

by Betty Lipe, COA Vice-President

The new year is upon us and many of the clubs are sharing a common problem: declining members and aging memberships. I have heard from several clubs that are having a problem attracting new and younger members. I do not have the answers as my club, the St. Petersburg Shell Club shares the same problem. I do know that in 1996, at the COA Convention held in St. Petersburg, we held a seminar on Public Relations for Shell Clubs and many of the suggestions that came out of that seminar have worked for clubs that participated. If any of you would like to receive a copy of the audio tape of the seminar, please write to me, or E-mail me. I will be happy to send out copies as long as they last. If your club has had success with this endeavor and would like to share the secret of your success with others, please get in touch with me. I will be happy to include your successful measures in this column.

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with an initial stop at Malacolog 2.0. Here you will find not only valid names and synonyms, but also geographic and bathymetric ranges, authors and dates, and references to both technical descriptions and illustrations. Data was pulled from several malacological collections including the one at the Academy of Natural Sciences of Philadelphia and over 1,000 publications on Western Atlantic gastropods.

A search within Malacolog 2.0 will turn up the following fields: family, genus, subgenus, species, subspecies, associated name, status, author, date, attributed author, original genus, parentheses, figure, type locality, all localities, comments, references, and some 15 other fields. The obvious benefit of having this immense database on the Internet is its dynamic nature. As new species are named, ranges extended, and synonymies discovered, it can all be updated in the database for the benefit of professionals and amateurs alike.

The driving factor behind this database, Dr. Gary Rosenberg, is respected and well known to most COA members as well as those of

APPLICATION INSTRUCTIONS

There is no official application form. Applications should not exceed 5 single spaced pages and should include the following:

- 1) Project title;
 - 2) Project summary—not to exceed 200 words;
 - 3) Proposal body, including background information (=introduction) necessary to understand the project and its significance, a material and methods section, and the proposed research plan;
 - 4) Itemized budget of estimated expenses;
 - 5) Literature referenced; and
 - 6) One page CV or resumé including address phone number, email, etc.
- All students must submit a letter of recommendation from an academic or professional source.

If funding is being requested from several sources an overall budget for the project may be presented, with items and total amount requested from the HCS clearly indicated. The Constance E. Boone grant may only be used to cover or defray travel expenses to and from Houston and to cover room and board expenditures during the duration of the visit. Grants will not cover salaries, overhead, expendable or permanent equipment, conferences, or meeting costs.

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While browsing Conch-L the other evening I ran into an excellent dialogue on what is a shell club. I think the main idea that came out of this discussion is that the shell club does not have a mold to fit into. It is what the members want and like to do. It should encompass the serious collector as well as the beginner who likes to walk the beach and pick up even the pretty pieces of shells. I would like to say that I hope beginners are not put off by serious collectors; they are not ogres who will eat you if you pronounce the shell name wrong. I also hope beginners will understand that there are many shell collectors who do not know the common or nicknames that people like to call shells. The name that you use for the shell is your business, but please do not look down your nose or ignore someone else because he says the name differently than you do. You can always get out pencil and paper if you cannot understand each other. Remember that a whelk in the USA is not a whelk in the Bahamas.

See you at the Convention in Houston.

us on Conch-L. A nice feature of this site is Gary's article explaining Malacolog 2.0 and presenting some of the conclusions to be derived from all of this data. Some typical conclusions include: comparisons of biodiversity over time, species count of the Western Atlantic compared to the Eastern Pacific, and endemic population status in different habitats. Also in this article you will find there are plans to link with a comparable European mollusk database as well as listing the remaining mollusks from the Western Atlantic—both linked to the Malacolog search engine. At the present time, while limited, this site is still an incredible tool. You can confirm data on any of your Western Atlantic gastropods and not have to worry about which version from which book is correct.

And that is it for this issue. Three of the best shell related web sites—each very different and each with special features to recommend it. Try them out—I'm sure you will be glad you did.

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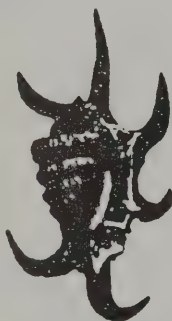
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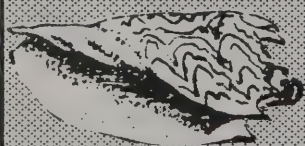
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After many years of fruitless pleas, threats and promises, your editor has finally lured Kurt Auffenberg into the confines of these pages. We anticipate that you will find a place in your conchological studies for this, his first offering of historical malacology. As we pursue our hobbies amid all the technological conveniences of the year 2000, and the publishing explosion of shell books in the last 20 years, it is well for us to reflect on the experiences and limitations of the past; it's, after all, the past that built our hobby and discipline to its present state. Thanks, Kurt!

HISTORICAL MALACOLOGY

by Kurt Auffenberg

William Benson (1803 - 1870)

William Benson was born in 1803 in Dublin. Although records of his birth are apparently lacking, it is known that his parents, Lt. and Mrs. M. A. Benson, lived in Dublin during that time. No information on his early childhood has come to light, but in 1819 Benson entered the Haileybury College. This institution was founded by the East India Company (E. I. C.) as a training center for civil servants destined to be stationed in India. The E. I. C. felt that all students had to complete a two-year course "before their recruits were exposed to the vices of Calcutta." Benson must have been well-placed socially because admittance into this institution had to be sanctioned by the Director of the Company. Benson completed his studies at Haileybury and arrived in Calcutta on 30 October 1821 to begin his career in various aspects of civil law. Benson was transferred to Delhi in 1836 where he assumed the role of Officiating Judge. He remained in India for 26 years, retiring to his homeland with his family in 1847. The few available correspondences from Benson indicate that he was permanently disabled (on crutches, cause unknown) by the early 1850's and traveled to Europe for unsuccessful rehabilitation. His busy schedule in India apparently did not allow much writing time as most of his papers were written after retirement. But during his tenure in India he obviously always found time to collect specimens, at many locations in India and in other countries when on furlough from his courtroom.

The origin of Benson's passion for malacology is unknown, as is the reason for choosing land snails as his focus. Regarded as a pioneer in research on the diverse land snail fauna of India, Benson conducted studies on material (some of which was self-collected) from Mauritius,

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St. Helena Island, South Africa and areas between India and Europe, studies which are also considered classics. He worked with many well-known collectors and researchers: Godwin-Austen, Layard, T. Hutton, the Blanford, Theobald and Stoliczka. His enthusiasm was contagious and his work and guidance produced a series of serious malacologists and a vast accumulation of information on the land snails of the Indian subcontinent.

The material once held in Benson's vast shell collections is scattered. Benson made no arrangements for the disposition of his collection after his death. Apparently, there was friction between Benson and J. E. Gray, the head malacologist at the British Museum of Natural History, London, so most of his material was given to the Zoological Museum at Cambridge University in 1873 by the executor of his estate. However, Benson exchanged a great deal of material with the Blanford, Theobald, Godwin-Austen and Hugh Cuming. Much of this latter material now resides at the British Museum. Unfortunately, his personal collection suffered greatly at the hands of Sylvanus Hanley, who destroyed most of Benson's original documentation and labels. It is not known exactly how Hanley gained access to the collection, then at Cambridge, but it is well-documented that blame for the destruction of Benson's original labels and some of his manuscripts rests on Hanley's shoulders.

The locations of Benson's type specimens have caused much consternation over the years. Most of his types should be located in the Cambridge University collection. However, some surely exist in the holdings of the British Museum originating from Theobald, Godwin-Austen, and the Blanford. Type specimens from Benson's work with Cantor's Chinese material probably remain with that collection. Benson also worked up Bengal material in the Asiatic Society Museum. Unfortunately, of the fourteen species Benson described from this research, types of only three species can be located. Some researchers have failed to realize that specimens of Benson's species now in the Indian Museum were not examined by Benson and were perhaps collected after the original descriptions were published. These specimens can not be regarded as types, but a couple of lectotypes have been invalidly proposed. Future workers should search for Benson's type series in the Cambridge University collections first, although without the original documentation and with Benson's frustrating habit of failing to include illustrations with the original descriptions, type selection may prove difficult.

For more information on the life and times of Benson I refer the reader to Fred Nagg's fascinating and thorough paper "William Benson and the early study of land snails in British India and Ceylon," *Archives of Natural History* (1997) 24(1):37-88.

BOARD TALK...

Bobbie Houchin, COA Treasurer

WALTER SAGE FUND REPORT

On October 18, 1999 the two Walter Sage Funds—#1 & #2—were combined into one fund: COA-Walter Sage Fund. The balance as of December 31, 1999 is \$16,046.57 and is invested in 2 CDs.

From the beginning contributions have been given in the memory of Walter Sage, a long time supporter of COA, who served as Treasurer for many years. Also, Mary Ann Sage donated the Shell Fabric Collection that her son, Walter, had collected over a few years. Grants have been awarded to deserving recipients in the field of malacology and conchology to help with their projects. The following are some facts you might be interested in:

1. Contributions (including the W. Sage Memorial Fund turned over to COA in March 1998 by the Academy of Natural Science-Philadelphia): \$5,055.00
2. Walter Sage's Fabric Collection -- total sales: \$10,077.96
3. Interest earned since August 1, 1996: \$1,763.61
4. Grants the COA-Walter Sage Funds have awarded since 1997: \$850.00 NOTE: While the Walter Sage Memorial Fund was still at the Academy in Philadelphia, and maintained by Dr. Gary Rosenberg, COA Educational Grants Director, the fund awarded 2 Grants totaling \$875.00

COA was pleased to announce in the December 1999 issue of *American Conchologist* that we are now a 501(c)(3) organization. This includes the Walter Sage Fund. Your gift is now tax deductible so you might consider donations to the Walter Sage Fund. Helping it grow will allow us to award more grants to promote the interests of our shell world.

Only one-half of earned interest can be used for grants; the rest is reinvested in the fund.

CONE WARS

by Don E. Barclay

The following article, a continuation of Part 1 in the December 1999 American Conchologist, appeared in a series of episodes or "rounds" last April and May on COA's listserver, Conch-L. While the information it uncovers is likely already known to science, Don's engaging style and humorous approach to the subject of *Conus* predation upon *Cypraea* make his experiments vivid and memorable, and not always what one would expect.

Don named his cones and cowries for well known members of Conch-L, as much to keep track of them as to add interest. But giving them human names made them seem to have human motives and emotions, and had the subscribers rooting emphatically for the survival of this cowry or that cone. We hope the readers of American Conchologist enjoy the "epic" as much the readers of Conch-L did.

Cone Wars—Round 5

Everyone seemed to have survived the night, even if Mark *Episcopatus* hadn't moved. I could still see his siphon, and it even retracted a little occasionally, so I took that as an encouraging sign. As I looked more closely at the *Cypraea erosa* that Art had staked out the night before, I couldn't see any mantle exposed, so I decided to remove him from the tank and give him a physical. As I suspected, only an empty cowry shell remained. Looks like Art had his *Cypraea erosa* dinner after all!

Everything remained calm in the aquarium the rest of the day. The cowries stayed parked in the same spots, with the *Cypraea arabica* at the top of the tank, Helmut Lynx in the corner behind a clump of grass, and the others scattered around at random. As the evening wore on, I closed the window blinds and turned out the aquarium lamp, and waited to see if the action would pick up. It did.

Within two minutes after I extinguished the light, Eduardo C. *Magnificus* came bursting out of the rubble, and headed straight for Helmut without any hesitation. I grabbed my camera, and waited to see what would happen. Eduardo crawled directly onto Helmut's dorsum and extended his long, red proboscis around the cowry's shell. Helmut was still completely retracted into his shell, but sensed immediately that something was wrong. He went from being totally withdrawn to having his entire foot extended in only a few seconds (awfully fast for a cowry). Helmut started trying to climb the glass, and indeed was lifting the *Conus magnificus* off the bottom, when Eduardo moved his proboscis around to Helmut's head. I thought, "This is it for poor Helmut," and snapped a photo. The rule that the act of observing an event may actually affect its outcome certainly applied here, but not in the same sense that the physicists would apply it. The flash stunned Eduardo for just a moment, long enough for Helmut to gain an inch of vertical glass and dump Eduardo off in the gravel.

Having narrowly escaped, Helmut cruised around the tank the rest of the evening, never letting Eduardo near him. Eduardo remained active, and followed Helmut's trail for hours. Several times he passed very near other cowries, but showed absolutely no interest. Eventually, Eduardo returned to the bottom of the aquarium, apparently resigned to the fact that this was not the day he would catch Helmut. He sat feigning interest in a clump of branch coral until I went to bed.

Art never resurfaced that night. I'm not sure how long a *Conus textile* will remain buried after he's eaten, or even how often they feed, but it looks like a good chance to find out. Tom E. did finally resurface, but never showed anywhere near the interest in chasing cowries that he had shown the night before. And Ross C. briefly meandered around the aquarium too, but he also seemed subdued. Maybe the lack of fresh cowry trails everywhere made the not-quite-so-new surroundings seem more normal?

n5ols@samoatelco.com



Puffer, bane of the aquarium, inspects Tom *Episcopatus* and his *Cypraea caurica* friend.

With things settling down and the cowries on patrol, I decided to call it a night. The only other thing I had noticed was that my little puffer had now started to follow the damsel fish's example, and had begun to nip at both the cowries and the cones. I removed him in favor of his ocean home.

Next morning when I took inventory, it was much the same as the day before. Eduardo and Art were still buried, as was Tom. Even Mark was now half-buried, about six inches from where he had spent the past two days! Only Ross was exposed, with the anterior part of his shell inserted into the aperture of the juvenile *Cypraea talpa*. Helmut had found a new perch at the top of the aquarium in one of the front corners, and the other cowries were once again distributed around the tank. The only thing that was amiss was a single, empty *Cypraea moneta* shell, obviously someone's midnight snack.

Ross *Canonicus* and the juvenile *Cypraea talpa* were still in the same positions late in the afternoon. Curiosity finally got the better of me, and I took my tongs and extracted the *Cypraea talpa* from the tank. It was very dead, but only half eaten. I don't know if the fish had eaten on the cowry, or some of the tiny hermit crabs, or if Ross had enjoyed some success himself. If Ross was the perpetrator, he certainly didn't do the extraction job that the molluscivorous cones usually do on cowries. Then again, Ross *Canonicus* is relatively small, and the cowry fairly large. He certainly seemed to have shown some interest in the *Cypraea talpa*, though, judging by their positions, whether while the cowry was living or already dead.

Once again the daylight hours went by peacefully, and only when the lights were out did the aquarium come to life again.

Cone Wars—Round 6

Within a few minutes of extinguishing the main aquarium lights, once again signs of life began to appear. Most of the cowries, including Helmut Lynx, were distributed around the water line at the top of the tank, and all the cones except Marcus *Episcopatus* were buried. Mark was still moving his siphon, but had moved little since he was harpooned by Art, the *Conus textile*. Eduardo C. *Magnificus* was the first to move, bursting from the rubble at the bottom of the aquarium, and as might be expected, headed straight up the wall to the spot where Helmut was stationed. He climbed fairly quickly at first, but as he approached the cowry, he slowed until he was barely moving. I got my camera and waited to see what would happen.

When Eduardo got within a few millimeters of Helmut, he stopped. He extended his siphon to within about a millimeter of Helmut, and just sat there. And sat. Eduardo would move his siphon to either side, back and forth, but never made any attempt to harpoon Helmut Lynx. For two hours I sat there, camera in hand, waiting for one of the snails to break the standoff. Neither one had budged, when along the water

line came an unsuspecting *Cypraea caurica*. As it became obvious that the *Cypraea caurica* intended to crawl between Helmut and Eduardo, I thought, "OK, here's an easy meal for Eduardo!" As the *Cypraea caurica* forced his way between these two, Eduardo never retracted his siphon. Instead, he simply "folded" it to one side, and allowed the *Cypraea caurica* to pass unmolested. He showed not the slightest interest in the *Cypraea caurica*, and as soon as it was out of the way, Eduardo resumed his stakeout on the *Cypraea lynx*. For a total of three hours Eduardo kept his vigil, then finally turned around and headed back to the bottom of the tank. He buried himself without any further attempts at catching a meal, and I went to bed.

The next day Mark E. had still not moved, and his siphon was no longer visible. The third day after he was stung by Art I removed Mark from the tank, and sure enough, he was dead. It seemed amazing that he had survived more than two days after the encounter with the textile cone, only to eventually succumb to the toxin. His foot seemed to be paralyzed almost from the beginning, yet he had crawled several inches and partially buried himself just before he died. It made me wonder just how close he had come to surviving the encounter.

That afternoon, a good friend and outstanding photographer asked if he could borrow Tom E. and Eduardo C. M. for a little photo session in the ocean. I said sure, so he took the two cones on a field trip to Faga'alu, on the west side of Pago Pago Harbor. He managed to get photos of both cones, as well as some other creatures that he had planned to photograph, but unfortunately lost track of Tom Episcopatus, and only came home with Eduardo. I was happy to have Eduardo back, but when I put him in the tank he immediately buried himself, and I didn't see him again for five days.



Andy Omaria climbs over brother Gary.

Thus began a quiet period in the Cone War aquarium. For several days and nights there was little action; all the cones stayed mostly buried, and the cowries toured the rocks and glass with no worries. I wondered if everyone had become accustomed to the aquarium, and with the novelty gone, had now entered a period of more typical activity. I decided to shake things up a bit, and after a few hours searching, returned with three new residents for the tank. Meet Paul Textile, slightly smaller than Art, and the Omaria brothers, Andy and Gary.

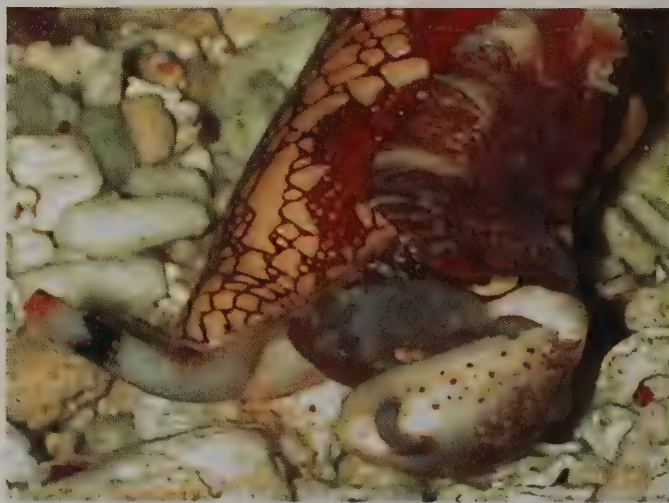
Each *Conus omaria* had a scar on his dorsum, but they were easy enough to tell apart: one had a straight scar (Andy) and one had a curved scar (Gary). I put all three newcomers in the tank at once,

turned out the light, and waited for the fireworks. It took about five minutes for the three cones to bury themselves, and none of them resurfaced for the rest of the evening! I guess the new surroundings might not have been responsible for all the previous week's activity after all.

I thought it over carefully, and decided the unsettled cowry activity might have been responsible for the cones' initial excitement, so I determined to collect a few more small cowries for the tank to test whether anyone became more motivated. I collected two *Cypraea isabella* and four *Cypraea erosa*, and dropped them in the tank with the cones. I didn't notice much activity that evening, but in the morning there was one empty *Cypraea isabella* shell and one empty *Cypraea erosa* shell, so at least a couple of the cones had had dinner during the night.

That evening I came in and extinguished the aquarium light, and waited to see if any of the cones would chase the remaining cowries. Most of the cowries were lined up near the water line at the top of the tank, though a few were on the rocks or sitting on the gravel. Helmut Lynx had taken up residence in the clump of branch coral, and had been there since the previous night. A couple of minutes after the light was turned off, Eduardo C. Magnificus came bursting from the rubble, and made straight for Helmut's hideout.

Helmut appeared to be in a fairly safe place in the coral, but this time he didn't wait until Eduardo was upon him before he started his escape maneuvers. When Eduardo was still several inches away, Helmut seemed to sense his coming, left his hiding spot in the coral, and began climbing for higher ground. He climbed to the highest point on the coral branch, actually out onto the very tip of one of the branches, and stopped there. Eduardo continued on to the place where Helmut had been, and then actually stretched upward toward Helmut's new perch, with his siphon pointed directly at him. Eduardo knew the Lynx was up there, but he couldn't seem to figure out how to get to him. He pirouetted slowly several times, keeping his siphon aimed directly at Helmut, but never made any attempt to climb the coral. He eventually gave up and crawled away, and Helmut remained perched on the tip of the coral branch for the rest of the evening. It turned out that this was the last time Eduardo showed any particular interest in Helmut Lynx, as he seemed to have decided that *Cypraea isabella* and *Cypraea erosa* were now more to his liking, or at least more suited to his hunting skills.



Eduardo Magnificus makes short work of extracting a *Cypraea erosa*.

Cone Wars— Round 7

About the time that Round 6 of the Cone Wars ended, it was my pleasure to welcome Betty Jean Piech and Homer and Ann Rhode to Samoa. We spent a lot of time in the water and riding around the island, so I didn't spend a tremendous amount of time watching the tank. Still, we did observe a few interesting things while they were here! I'll leave most of that story for others to tell. At least they got to meet Eduardo and Helmut.

I arose at the crack of noon one morning, gathered up my snorkeling gear, and prepared to meet the other shellers at the Rainmaker Hotel. I decided to take a look in the aquarium before I left, just in case anything unusual was happening. It was. I had collected a pair of *Bursa lamarckii* the week before, and dropped them in the tank so that Betty Jean could look at them when she got here. As I watched, Art Textile's anterior tip came out of the gravel (he was almost exactly spire-down), and pushed the *Bursa* about half an inch off the bottom of the aquarium, harpooning him at the same time! I was stunned, as it appeared that Art had either trailed the *Bursa* from under the gravel, or had been lying in wait for some victim to wander into his snare. Anyway, the *Bursa* attempted to shut his trap door, but the damage was done. Art sat there working on extracting the *Bursa* until I left for the hotel. I wondered: are *Cypraea* really the prey of choice for the molluscivorous cones? I had seen a *Conus omaria* attack a *Nassarius* on dry land a few weeks before....

When I returned from snorkeling, I brought a handful of *Cypraea isabella* and *Cypraea erosa*, plus a couple of other small cowries to drop in the tank. Art was no longer visible, and the *Bursa lamarckii* was back in his normal position. I couldn't resist seeing whether Art had been successful, so I got my tongs and fished the *Bursa* out of the aquarium. He wasn't completely eaten, but Art Textile had managed to remove about half of his foot. I took the *Bursa* over to the sink to see if I could get the rest of the animal out with a dental pick, and I did. The animal seemed to be semi-dissolved, at least at the attachment points, and the entire animal came out of the shell, covered with slime, and with almost no effort. I have seen cones extract cowries so completely that there was absolutely nothing left in the shell, but it's quite a task for us humans to do the same thing on a fresh animal. Art seems to know a few tricks that I don't know.

I went back to the aquarium to look for the *Bursa*'s operculum, expecting either to have to dig for it or to choke it out of Art. Instead, there it was, only a short distance from where the *Bursa* had been lying. I managed to snag it with the tongs also, and put it in a bag with the *Bursa lamarckii*. (These two *Bursa lamarckii* are the only ones I've seen in over three years here.) I gave the *Bursa* to Betty Jean, complete with its data slip/death certificate from Don's Aquarium.

Although I hadn't seen much of Paul Textile since I had put him in the aquarium (actually, I hadn't seen him at all), the Omaria brothers, Andy and Gary, had been quite active. They were out practically every night, with Gary preferring to cruise the rocks and clumps of halimeda on the bottom of the tank, while Andy spent a lot of time climbing the walls. Eduardo was right there with them, and Ross Canonicus even joined the hunt occasionally. Nobody seemed to have much luck while I was watching, but with the introduction of different cowry species into the tank, things began to change. Every morning when I'd check the aquarium before going to work or off to meet the others to go shelling, there would be one or two freshly-killed cowries in the tank. While my visitors were here, I removed 14 empty cowry shells from the aquarium! The preference was definitely for *Cypraea isabella*, with eight of them being eaten, along with five *Cypraea erosa* and a single *Cypraea caurica*. The population of cones in the tank at this time consisted of two *Conus textiles*, Art and Paul; two *Conus omaria*, Andy and Gary; one *Conus canonicus*, Ross; and Eduardo C. Magnificus.

By proximity, I could guess who had probably eaten several of the

cowries. Although I couldn't blame Andy Omaria for any of the kills, Gary O. had taken up residence in one of the clumps of halimeda, and I strongly suspect that he ate the *Cypraea erosa* and *Cypraea isabella* whose shells ended up in the same clump. It seemed like his strategy of letting the prey come to him was more successful than brother Andy's head-on approach. Several empty cowry shells appeared in the middle of the open gravel over a short time period, and I am fairly certain that these were Art's and Paul's ambush victims, assuming the attack on the *Bursa lamarckii* was typical *Conus textile* behavior.

Eduardo C. Magnificus had put on a couple of millimeters of new lip growth during this time, so he evidently had been catching his share of cowries, even if the menu still didn't include *Cypraea lynx*. (Helmut had established a new residence in one of the corners near the top of the tank.) On what was supposed to be the last night of my visitors' Samoan holiday (had their flight not been canceled), we finally had the chance to witness Eduardo in action.

I turned the aquarium light off as soon as I found out that the Rhodes and Betty Jean were going to be with us another night, in hopes that they might get to witness some activity in the tank. Sure enough, Eduardo came out of hiding, and started slowly up one of the corners of the aquarium, directly below a *Cypraea erosa*. As Betty Jean said, "You can't really tell that he's moving, but the space between Eduardo and the cowry is shrinking." Eduardo continued the slow-motion stalking until he was within about an inch of the cowry, then extended his red proboscis as far as it would reach, and harpooned the hapless *C. erosa*. The *C. erosa* immediately fell to the bottom of the tank, but Eduardo didn't seem to know exactly what had happened to the cowry. He turned around and started moving sideways initially, then slowly turned toward the bottom of the tank. It appeared that he did indeed know where the cowry was after all, but then he did a course reversal and acted like he was going to resume his hunt at the top of the tank. By this time it was getting late, and the paralyzed *C. erosa* wasn't looking so healthy, so I pointed Eduardo in the right direction (I punched him off the wall of the aquarium). Once on the bottom, it only took Eduardo a couple of seconds to realize where the cowry was, and in a very short time he was working on extracting the cowry from its shell. I expected him to engulf the shell, but he didn't. He formed a semi-circular ring around the basal margin of the *C. erosa* with his foot, giving him something to push against. Within about 35 minutes, he had completely emptied the shell.

I had assumed that he would immediately bury himself after eating, but not Eduardo. He resumed his hunting for the next hour, then finally decided to call it a night. He only took the next day off from his hunting, then was back to his normal rounds by the second day. It was beginning to appear that the cones in my aquarium had no interest in each other, each one having staked his territory and going about his business night after night. It continued this way until I got a call at work from my wife, who told me that Chuck Brugman had just caught a "big marmoreus" (it was a *Conus bandanus*) and had put it in my tank.

Cone Wars— Round 8

After being informed by my wife of my new cone's arrival, I was anxious to get home and see the new guy in action. Bob Dayle had cautioned that *Conus textile* and *Conus marmoreus* were natural enemies, and I was curious to see if the reaction would be the same between the textiles, Art and Paul, and a deep-water first cousin of *Conus marmoreus*, *Conus bandanus*.

When I arrived at home and checked on the aquarium, all was calm, with none of the molluscs in the tank active. I removed the *Conus bandanus* and measured him, a nice 83 mm, and I dubbed the new resident Emilio. The lights had been on since Emilio Bandanus had been introduced to his new home, so I extinguished them to see if the activity would pick up a little. In typical fashion, Eduardo C. Magnificus was

the first to make a move. Eduardo came crawling out of the rubble, ignoring the new guy, and headed up the wall of the aquarium in search of an easy meal. He eased up to a *Cypraea caurica* positioned near the water line, sniffed at him, and turned around and headed back for the bottom of the tank.

This time he went straight toward Emilio Bandanus, evidently just recognizing him as an intruder. In faster-than-cowry-stalking speed, Eduardo marched up nose-to-nose with Emilio, extending his proboscis in a gesture that I was sure was not "Welcome" in cone language. Emilio beat him to the punch, however, and snaked out his long white proboscis and harpooned my favorite *Conus magnificus*. Eduardo flinched, then turned to crawl away, but only moved an inch or so. Emilio Bandanus withdrew into his shell, and made no attempt at eating Eduardo. I watched as Eduardo C. Magnificus stretched out his foot and retracted it, and moved his siphon, but he seemed to be unable to coordinate his crawling muscles. His foot would move, but he couldn't crawl. This was the exact reaction that I had seen in Mark Episcopatus after Art Textile had stung him, and I knew that it didn't bode well. Eduardo remained in the same location for the next three days, except for the occasions when I removed him to verify that he was still alive and, like Mark, after three days he was dead. It was depressing, but life in the aquarium goes on.

Nothing much happened the rest of the evening, but when I arose the next morning practically every cone in the aquarium was out hunting, with the exception of Art and Paul. A few days before, with everything settled, I had introduced two new residents to the tank, a *Conus tulipa* and a *Conus striatus*. Both of these new guys are piscivorous, but I thought I would just put them in the tank for a while to see how they interacted with the molluscivorous cones. The *Cypraea tulipa* was the most active cone I had had in my aquarium, and spent all the hours of darkness out hunting. He would "bulldoze" the cowries around the water line of the tank, and attempted to crawl down the water circulation pipe with the air bubbles in his face, but he never made any attempt at eating anything in the aquarium, other than my little trigger fish. (He did finally catch the little guy.) This morning he was out crawling as usual, as were Andy and Gary Omara and Ross Canonicus. Emilio Bandanus had partially buried himself, with the tip of his siphon exposed just above the gravel.

I sat watching all the action this morning, curious how Emilio would react to all the other cones moving about. Andy Omara would be the morning's test case. Andy ambled toward Emilio, apparently lacking the sense of danger that Eduardo Magnificus had displayed. As Andy came closer, Emilio Bandanus extended his proboscis (which can stretch almost twice as far as his siphon, by the way). He "felt" for the *Conus omara*'s foot, found it, and zapped him. Andy was imme-



Emilio Bandanus vacuums out the *Conus tulipa*.

diately unable to crawl, and Emilio didn't retract this time. He slowly, almost clumsily, repositioned himself above Andy's aperture and, without extending his foot, proceeded to extract the victim from his shell. The process took almost an hour, but Andy's shell was completely empty when Emilio was finished. Twelve hours in the tank, and Emilio had killed two of my molluscivorous cones. I was beginning to wonder why a "super-predator" like *Conus bandanus* didn't simply wipe out the cone population in an area, instead of being as uncommon as they are in American Samoa.



Paul Textile leaves the scene, believing he has eliminated the *Conus bandanus* intruder.

After eating Andy Omara, Emilio buried himself in the rubble, with his siphon against the front glass of the aquarium. He remained there for the next two days, and gave me the opportunity to watch his reaction as the other animals moved over him. Several times cowries crawled over the *Conus bandanus*' siphon, but he never showed the slightest interest. In fact, for the entire time he has been in the aquarium, Emilio has ignored the cowries, showing interest only in the other cones. After a couple of days in this position, Emilio Bandanus decided it was time to move, and so did Paul Textile. As Emilio dragged himself from the rubble, Paul emerged on the opposite side of the tank, obviously perturbed. He crawled directly up to Emilio, but not in a frontal attack like Eduardo Magnificus had attempted. The textile extended his pink proboscis when he was still six inches from Emilio B. and approached him from the side, about an inch behind his anterior tip. The *Conus bandanus* froze as Paul Textile approached, and never moved to defend himself as he had done with Eduardo. Paul was strictly business, never hesitating. He stopped his advance as soon as his proboscis would reach Emilio's foot, and stung the *Conus bandanus* the first place he touched. Emilio instantly withdrew, but Paul wasn't finished. He crawled a little closer, extended his proboscis under the lip of Emilio B's shell, and appeared to harpoon him again. He repeated this five times, moving up the length of the shell toward the spire, and then turned around and marched off. Paul had obviously recognized the intruder as a dangerous enemy, and was intent on killing him, not on eating him. It wasn't quite a "David and Goliath" battle, but by volume, Emilio must be at least three times as large as the 63mm *Conus textile*.

Cone Wars—Round 9

After Paul Textile had made his calculated attack on Emilio Bandanus, he seemed satisfied, and headed toward the opposite side of the aquarium. I picked up my camera and was trying to get the thing to focus on Paul as he was exiting the scene when, through the

viewfinder, I watched a different proboscis extend from the rubble and harpoon Paul in the side of the foot! Paul flinched, as all the cones did when they were stung, but continued on to the other side of the aquarium and stopped with his siphon against the glass. Art Textile came crawling from the spot where he had ambushed Paul, and went over to investigate his victim. He didn't seem particularly interested in Paul any longer, and after a ten minute stroll, buried himself in the rubble again, this time with the tip of his siphon exposed.

Paul Textile remained motionless against the aquarium glass for about an hour, and it was beginning to look like *Conus textile* venom is deadly to another *Conus textile*. Paul proved otherwise, though; after a while he made another round of the aquarium. He ignored Emilio this time, then buried himself near the front glass. He also left the tip of his siphon exposed, and when one of the fish moved a rock or I tapped on the side of the tank, he would extend his proboscis and "feel" for any potential prey moving about!

I was just about convinced that Emilio was on his way to Bandanus Heaven when he began to crawl forward, and then buried himself in the rubble. He continued forward until his siphon was also against the front glass of the aquarium, only a couple of inches from the spot where his nemesis, Paul, was buried. All was calm for some time after that, and as it appeared that things had settled down for the evening, I shut off the lights and went to bed.

The next day things looked essentially as I had left them. There were no stray shells on the bottom of the aquarium, and I could clearly see Paul and Emilio against the glass. I could also see where Art was hiding, as his siphon or proboscis would occasionally protrude from the rubble. He had settled back into what must be his normal ambush position, barely under the surface of the aquarium floor. As I watched the two *Conus textile* individuals extend their probosces in response to any movement in the tank, I noticed that Art's was quite a bit darker than Paul's pale pink proboscis. Diet, or lack thereof, possibly? While I pondered the color difference, an oblivious *Cypraea caurica* stumbled around the corner, headed straight for Paul Textile's hiding place.



Paul Textile extends his proboscis from the rubble, attempting to locate the reverse-capable *Cypraea caurica*, and finds him!

As the *Cypraea caurica* approached, Paul extended his proboscis to full length, whipping it around in an attempt to locate his potential breakfast. The cowry never seemed to detect the cone in front of him, even though Paul was certainly aware of the cowry's presence. The *Cypraea caurica* continued forward until Paul's proboscis was raking across the front of his shell, and then he froze. Did you ever wonder whether a cowry can crawl backwards? This one did. And he didn't just rise up and turn, but his foot undulated in reverse motion, and he moved directly backward about an inch! Paul never seemed to figure out where the cowry went, and maintained his ambush position without giving chase. After the *Cypraea caurica* had backed up, he turned

and climbed up on the glass, making an arc above Paul's hiding spot, and then resuming his rounds on the gravel once he was clear of the danger zone. Paul went without breakfast.

Nothing else of note happened that morning, and all was calm when I darkened the living room that evening. It didn't take long for the *Conus tulipa* to sense that nightfall had come, and within a few minutes he had resumed his nightly hunting. He started out by climbing the glass, but in a short while had worked his way down to the bottom perimeter of the tank, obviously on course to crawl directly over Emilio Bandanus. I reached for my camera and waited.

As the *Conus tulipa* continued toward Emilio, the *Conus bandanus* sensed his approach, and began to extend his proboscis. The *Conus tulipa* was crawling on the glass just above Emilio when Emilio struck. A quick sting, and the *Conus tulipa* fell from the glass, toppling onto his back. He landed almost directly on Emilio's dorsum, and the *Conus bandanus* spent the next thirty minutes clumsily attempting to reposition himself to finish off the *Conus tulipa*. During this time the *Conus tulipa* exhibited the same symptoms that the other cones had shown after being stung: he could move his siphon in and out, and could extend or retract his foot, but was unable to crawl or get any grip on the aquarium glass.

Emilio did finally get himself and his victim oriented suitably, then harpooned the *Conus tulipa* a second time for good measure. The *Conus tulipa* did not flinch this time. Emilio then wrapped his "mouth" around a section of the *Conus tulipa*'s foot, beginning near the posterior end, and then slowly stretched it down over the anterior part of the foot. As the *Conus tulipa* withdrew into its shell, Emilio went in with it. For two hours the *Conus bandanus* slowly extracted his victim, and I could even see the colors of the tissue being ingested through the semi-transparent tube that the *Conus bandanus* used for feeding. For about an hour of that time, Emilio also had his siphon inserted into the *Conus tulipa* shell. Could he tell by "smell" how the extraction was progressing?

After Emilio Bandanus had completely removed the *Conus tulipa* from its shell, he cast it aside and worked on getting himself and his new meal back into his shell. The *Conus tulipa* wasn't terribly large, but that thin Tulip shell holds a lot of animal! I had guessed that the *Conus bandanus* would settle down and hide for a day or so until he could completely retract into his shell, but Emilio didn't do that. It hadn't been too long since he had eaten Andy Omara, so he wasn't starving, but within about twenty minutes of finishing off the *Conus tulipa* he had managed to get his gut and foot both back into his shell. Emilio, now fat and happy, buried his nose in the gravel and all was quiet in the aquarium once again.

The aquarium remained quiet for the next two days. I could still see a proboscis or siphon tip emerge from the gravel occasionally, so I knew where Art and Paul Textile were hiding. If only Emilio had known. Emilio, now recovered from his feasting, decided to check out the territory on the other side of the aquarium. He pulled himself from the rubble, and slowly crawled toward the middle of the tank, directly into Art Textile's ambush. As he passed over Art, the results were predictable. Art reached up and harpooned Emilio, and since Emilio was directly above the anterior tip of Art's shell, whatever trick he had used on Paul Textile didn't work. I now believe that Paul must not have been successful in all his earlier attempts at stinging the *Conus bandanus*, because the sting from Art stopped Emilio dead in his tracks. With Emilio withdrawn into his shell, it was hard to tell if Art stung him more than once, but I suspect that he did. In any case, Art made no attempt at eating the *Conus bandanus*, but he did crawl from his hiding place and make a victory lap around the aquarium before burying himself once again.

I watched Emilio Bandanus carefully over the next two days, and it was a familiar pattern that I was observing. Like the others before him,

(Continued on bottom of next page.)

New Books:

Atlante Delle Conchiglie di Profondità del Mediterraneo by Roberto Ardovini and Tiziano Cossignani. *L'Informatore Piceno, Ancona, Italy. pp. 112. 21.5 cm X 30 cm. 4 bathymetric maps + 239 color plates. ISBN 88-86070-20-9. 1999. Deepwater shells of the Mediterranean Sea. In Italian. Corals included. Introduction, list of species, excellent pictures of many small and little known Mediterranean shells.*

Chitons of the World: An illustrated synopsis of recent Polyplacophora by Frans J.A. Slieker. *L'Informatore Piceno, Ancona, Italy. 215 mm X 300 mm. Pp. 160.*

Introduction: "A serious collector and student of shells needs to have an extensive library of specialized literature (monographs, taxonomic reviews and faunistic literature) at his disposal, enabling him to identify all described taxa. Compiling such an extensive library is not only a time-consuming activity, it can also be a very expensive one. Many attempts have been made to publish exhaustive reviews regarding the marine malacofauna, but unfortunately the majority of those pretentious projects were prematurely ended. So we have to do with publications treating a taxonomical group (a single class, family or even smaller taxon) or describing the malacofauna of certain geographical regions. Altogether these works, piece by piece, enhance the understanding of the worlds malacofauna. This book adds to the same puzzle. It offers the first full-color general overview of the Molluscan class Polyplacophora: the Chitons of the world.

"It treats almost every species one can possibly encounter when identifying chitons along the seashores of the world or when studying specimens in collections. Quite a number of species, rarely treated in general or faunistic works, is added. Altogether over 500 species (including 61 types), about 60% of the 850 extant species currently known to science, are illustrated and briefly described in this book.

"Those species lacking in this book are mostly chitons living in the deepsea which are often only known from the type material and to be found exclusively in the collections of the larger institutes. Their descriptions and illustrations can be found in specific scientific publications.

"I hope that both conchologists and malacologists, professional or amateur, will find this a useful tool in studying this fascinating group of molluscs."

THE OLD SHELL GAME continued

Cleaners and Supplies" in the Yellow Pages. But often you discover that they only carry large, expensive industrial models, not the small tabletop units that are most useful to collectors. Scientific supply houses which serve schools, hospitals, and research institutions usually do offer a variety of small models. A one quart (1 liter) unit is adequate

CONE WARS continued

and even his own victims, Emilio would retract his siphon, then extend it. At first he could extend his foot slightly, but after the first day he seemed capable only of moving his siphon. I checked on him a couple of times each day to see if he was still alive, but like all of the other "Cone Wars" victims, on the third day after being stung he was dead.

And so ends this volume. Salute all the warriors, but hail *Conus textile*, Champion of the Cone Wars.

The 2001 meeting of the American Malacological Society will be held in Vienna in conjunction with Unitas Malacologia. This is the first time that an AMS meeting has been held outside North America. In 1938, the then AMU met in Cuba, and in 1939, 1960 and 1967, its meetings took place in Canada. (Thanks to Charlie Sturm for the information.)

Marine Biology and Rainforest Workshops will be held again this year in Belize, Costa Rica, Ecuador, Honduras, Panama, Peru, Alaska and Australia. For more information contact Mike Nolan, Director, Rainforest and Reef 501 (c)(3) non-profit, 29 Prospect NE Suite #8 Grand Rapids, Michigan 49503 USA, Phone/Fax: (616) 776-5928/Toll Free: (877) 967-7467 (Fridays only) E-mail: rainforest@mail.org or mnolan01@sprynet.com

The 3rd International Workshop in Malacology will be held in Menfi (Sicily, Italy) June 15-19, 2000. It will be dedicated to: "Systematics, Phylogeny and Biology of Neogastropoda. Vincenza Rotolo - Via Selinunte, N 81 - I - 92013 - Menfi (AG) Italy. For more information go to the webpage: <<http://www.futuralink.it/vannarotolo/istituzione/index.htm>> Some speakers and tentative topics are: John D. Taylor (Natural History Museum, London) - Evolution and Systematics of Toxoglossa; Yuri Kantor (Inst. Animal Evolutionary Morphology and Ecology, Moscow) - Evolutionary patterns in Neogastropoda; Jerry Harasewich (National Museum of Natural History, Washington) - Evolutionary patterns in Neogastropoda; Guido Pastorino (Museo Argentino de Ciencias Naturales, Buenos Aires) - Evolutionary patterns in Muricoidea; Emilio Rolan (Sociedad Española de Malacología, Vigo) - The evolution of radular teeth and the systematics of cones; Baldomero Olivera (Dept. of Biological Chemistry, Salt Lake City) - "The Venomous Cone Snails: Biology, Toxinology and Phylogeny"; Alan Kohn (Dept. Invertebrate Zoology, Seattle) - Evolution of feeding in cone gastropods

Mid-Atlantic Malacologists Third Annual Meeting was held Saturday, 12 February, 2000 at the Delaware Museum of Natural History, Wilmington, DE and graciously and ably hosted by Timothy A. Pearce, Curator of Mollusks. Mid-Atlantic Malacologists (MAM) is a one-day gathering which facilitates contact among professional, amateur, and student malacologists who are interested in any aspect of mollusks. Participants will be able to present and discuss data, compare notes on methods and problems, and stay informed of research activities and opportunities. Even busy malacologists have time to attend this one-day meeting. We hope to present a report of the event in the June issue.

for nearly all conchological needs. I do have a 1 gallon (4 liter) model, and it's great for an occasional large *Spondylus*, but I don't use it much. I use my smaller units constantly. In shopping for a UC, optional features like heaters, timers, and variable intensity controls add expense, but do not add much utility. A simple unit with an on/off switch serves very well.

EPILOGUE

The Cone Wars "experiment" was hardly scientific, but it was educational for me and I hope others enjoyed it too. I learned several cone and cowry survival strategies, as well as getting a glimpse of the hunting methods that a few different species employ.

The *Conus textile* are certainly survivors, with a compulsion (and the equipment) to eliminate any potential competitors. The *Conus canonicus* survived mostly by staying out of the way of the bad guys, as did one of the *Conus omaria*. All but one of the original *Cypraea caurica* survived by using a variety of strategies, and then of course there is *Helmut*....

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Haliotis rufescens Swainson, 1822 on the West Coast of Iceland?!

by Moshe Erlendur Okon

Yes, Iceland. I too was surprised to see specimens of this pretty species here in Reykjavík, hearing that they were local. A bit of investigation brought me to Vogar, a small town in the Reykjanes peninsula in West Iceland. There I met Ásgeir Gudnason who is the culturing director of an abalone farm, not far from Reykjavík, the capital.

In 1990, Ásgeir was doing his second year training as a fishing technician at the Marine Research Institute in Grindavík, where he came across an experiment in raising abalones (*Haliotis rufescens*, Swainson 1822) being done there. Ásgeir became interested, and began studying and researching the subject, and potential markets for the abalones.



Ásgeir and friends; some of his breeding stock.

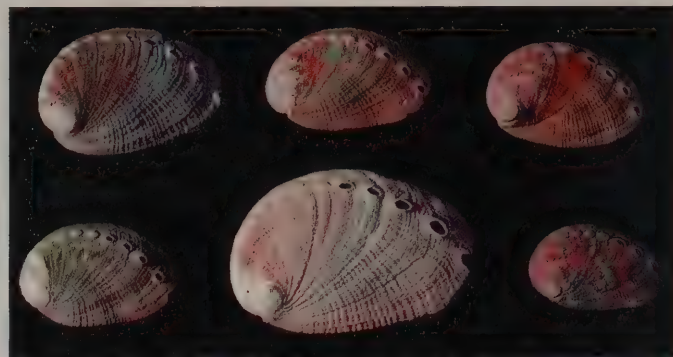
He picked up where the original researcher had left off, and three years later he left the institute with the 3,000 abalones he had raised and a breeding stock of 300. Together with his wife Sæunn he started his own farm, Sæbýli (meaning "Sea Farm"), and fed the abalones with twenty kilograms of kelp a week. Today, using a breeding stock the same size, he has over one and a half million abalones at Sæbýli and eleven workers. The kelp needed now is twenty tons a week, hauled in by a special boat built for that purpose.

The breeding is done by exposing male and female abalones to ultra violet light, which probably causes them to mistake it for mid-summer natural light. The males secrete sperm into the water and the females eggs. Ásgeir mixes the sperm and the eggs, which hatch twenty four hours after fertilisation. The free swimming larvae are then kept in tanks for four days, after which they are taken to a "greenhouse"



The greenhouse at Sæbýli (sea farm) where the young abalones grow.

where they settle on growing sheets and begin developing their shell. Six months later they are about 6-10 mm. in length and are moved to their permanent tanks where they are fed with kelp for about four years, at which time they reach a size of 80-100 mm.



Colour variability in the abalones, largest 54 mm.

The vast amount of sea water needed for the tanks is pumped from a well 200 meters deep on the farm. It comes up at 11 degrees centigrade, and is heated to 17 degrees for the juvenile stock. The water for the mature stock is mixed with the naturally boiling volcanic water of Iceland, which lowers the salinity to 33 promil. The water constantly flows through the tanks in order to keep them clean. During their lives, the abalones eat 12 grams of kelp for every gram they weigh. When the kelp is *Laminaria digitata* the colour the abalones produce in the shells is bluish green, but when they are fed *Palmaria palmata* the colour is reddish, and interesting lined patterns are created on the shells, which are 25% of the animal's weight.

When the abalones are about 100 mm. long and weigh about 100 grams, they are put into special containers which are kept moist, and supplied with oxygen during their journey to Japan and the US, where they recover in tanks, and are sold live in food markets. This year Ásgeir will be exporting ten tons, but hopes to export fifty next year, and soon reach 300 tons annually. The local market in Iceland is virtually insignificant, but during the Prime Minister of Japan's visit here recently, Ásgeir was asked to supply "Perlan," one of Reykjavík's most prestigious restaurants, with five kilograms of abalone meat for a meal in his honour.

Ásgeir's plans for the future include enlarging the farm, as well as experimenting with selective breeding, choosing the fastest growing abalones as breeding stock. The largest abalone in this stock now is over 20 cm., and Ásgeir hopes to break the world record of 30 cm. soon. He also hopes to enlarge his personal collection of world wide abalones he has been assembling for some time now, by trading some of those shells which are not exported.

He would also like to begin experimenting with other sea life used as food. "Perhaps some day," says Ásgeir, "I will experiment with raising shells for other purposes, such as cowries or cones." In the meantime, he offers an explanation to those rare abalones found with no holes. He believes it is due to chipping of the ridge around the holes when the shell is very young and subsequent repair, leading to a streak in the abalone rather than holes.



Some of the breeding abalones.



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PRESIDENT'S MESSAGE

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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MEMBERSHIPS are for the calendar year, January-December, late memberships retroactive to January. **1999 DUES:** (USA) \$20.00; **Postal Surcharge:** \$5.00 for Canada and Mexico; \$10.00 for other Western Hemisphere nations; \$12.00 for Europe; \$15.00 for Asia, Africa and the Pacific Rim. Please pay in U. S. dollars, or with a check on a U.S. bank with Transit Enrouting and Account Numbers printed at the bottom, or with money order; make checks payable to CONCHOLOGISTS OF AMERICA. **NEW MEMBERS AND ADDRESS CHANGES** go to Doris Underwood, **MEMBERSHIP DIRECTOR**. **RENEWALS** go to **TREASURER**, Bobbie Houchin. **BACK ISSUES** are available from **PROPERTIES DIRECTOR** Hank Foglino, 4 Trent Court, Smithtown, NY 11787-1266. Prior to 1985 \$3.00 each; 1985 to current \$5.00 each.

As I wind down my terms as your president I have reflected on all we have done during these two years. Of course, one never does all he or she hopes to do but we have made some giant leaps.

One of our leaps was to host our own convention without a host club. Not only did we put on our own convention but we broke all records in revenue and were able to substantially increase our educational grants for this year.

Another leap was our new tax status. Over the years many have worked on this project but with the help of the membership and a dedicated treasurer, we finally succeeded. We will be forever indebted to Ann Buddenhagen for all her help.

None of this would have been possible without the work and support of the members, officers and board of directors. I have thanked them before in this column and do so again. We have been a team all working together for the organization. I also wish to thank the membership for their unflinching support through these two years.

The Lambis Group also has some stars. Debbie Wills is our tireless web master. Amy Edwards manages our list. Travis Payne served as our Answer Man for a year and now it's Tom Eichorst. Our thanks go out to all the others who have worked to make the site beneficial to all. Lynn Scheu, Tom Watters, Emilio Garcia, Ross Gunderson, Gary Rosenberg and company have done it all for you and for our hobby. Others have made their contribution: Grace Johns and Rosalie Taylor are two who come to mind.

Now to end on a minus. For four years we have tried to get a program list to assist clubs who need programs. I have worked on this and so have Betty Lipe, Bob Granda and Steve Coker. We have come to the conclusion that the clubs want programs but few have programs to contribute. Because of the lack of interest we are laying this project to rest.

Now it is getting close to time to pack my bags for Houston. This will be a great convention. It will be full of surprises (don't miss the banquet) and big Texas events. I'll see you in Houston.

Linda Brunner

In Memoriam

Marjorie Stevens

Ellis Cross

Ruth Dixon Turner

Thanks!

A big thank you to all the Shell Clubs, newsletter editors and dealers for promoting membership in COA!

— Doris Underwood, COA Membership Director.

COVER: Jim Miller has photographed one of his favorite subjects for us, *Argopecten irradians*. This group of normal colored scallops is set off beautifully by the orange specimen, center. For more of his great photos and more about *A. irradians*, see his article, this issue, on p. 3.

BAY SCALLOP SEASON

by Jim Miller

This particular story begins way back in the late spring of 1969, a full 30 years ago. I was exploring the shallow waters and flats along the Rickenbacker Causeway in Miami and this was my very first shelling trip. The first shell I found that morning—and the first live shell I ever found—was a Pear Whelk (*Busycon spiratum*) that was half buried in the sand beside a patch of turtle grass. Not long after that, I found two dark reddish brown True Tulips (*Fasciolaria tulipa*) just at the edge of the grass.

As I made my way slowly through the clear, foot-deep water, out of the corner of my eye I saw something move, but by the time I turned to see what it was, it seemed to have vanished. This happened several more times until at last I saw exactly what it was: a scallop. And it was swimming. Well, actually, lurching through the water is a better description. I picked up the inch and a half shell. One side was mostly a dull gray with a few white specks, while the other side was pure white. Compared to my other finds, this was not very impressive and I let it go.

Today I know that this was an Atlantic Bay Scallop or *Argopecten irradians* (most likely *A. irradians taylorae* if we want to be accurate, though I have no specimens to confirm that identification). Oddly enough, though I shelled for nearly a decade all around Miami and in the Florida Keys, I never saw another one.

I left Miami in 1978 and pretty much stopped shelling as I was moving around so much: Wisconsin, Georgia, California. Finally, in 1995, I moved to Tallahassee, Florida, a place I have always loved.

Now, a quick fast forward to the spring of 1999. I'm at the home of a well-known shell dealer and pull open a drawer to reveal about a dozen smallish gray scallops. I recognize them as the same shells I had found in Miami 30 years earlier and smile, recalling my first encounter with them. I took a few out, thinking it might be fun to have a some as reminders of that original trip. But honestly, they were so, well, blah-looking that I simply put them back and moved on to more colorful specimens.

About a month later, my wife, Margo, and I were having dinner with another couple, the Shenks (Larry and Connie) and we got to talking about boats. It turned out that we both owned 17-foot Boston Whalers. We had just purchased ours, while theirs was more than a decade old and still going strong. As we talked, they mentioned that scallop season was coming and that we should take both our boats out for the event. Now keep in mind that I had spent the winter of 1998 and 1999 occasionally offloading the scallop boats at Carrabelle, about an hour southwest of Tallahassee. I wondered if we were talking about the same scallop ("calicos" or *Argopecten gibbus*) and described them, though I was fairly certain calicos were a deep water scallop.

When they described the scallops to me, it was clear that they were talking about *A. irradians concentricus* and my enthusiasm waned somewhat. That is, until they mentioned that the previous year they had also found four large horse conchs while scalloping, one of which was a chocolate brown specimen. So we set a date (the Saturday of the 4th of July weekend) and a time to meet at Eagle Harbor in St. Joseph Bay, about a two and a half hour drive from our house. The plan was simple: They got the meat, I got the shells.

On that Saturday, we got to Eagle Harbor early since we had stayed in Apalachicola the night before. The sun was shining brightly, and the water was calm as glass, promising a glorious day ahead. We went ahead and launched our boat, pulled out of the marina and anchored in the shallows just offshore to wait for the Shenks who were due to arrive at 9:00.

We were enjoying the day, grabbing some sun, wading in the shallows for other shells, but by 10:15 AM there was no sign of another

Email: Jim_Miller@mindspring.com

Boston Whaler and we started to think they'd had a family emergency and wouldn't make it. Meanwhile, a brisk wind began coming in from the west, along with a thick cloud cover. I was going crazy just waiting there as boat after boat sped towards distant Black Island, the "hot spot" for scallops in the Bay.

Finally, just as we began to give up hope, we saw a truck pull into the parking lot towing a Whaler. Finally! Still, we had to wait for a long line of other boats to get into the water before they could launch, and by the time they joined us at the entrance to Eagle Harbor, the wind was kicking up some good-sized whitecaps, making our run to Black Island a bumpy one.

Once we had reached the east side of the island, we found it was packed with boats. The Shenks had heard that the best spot for scallops was actually closer to the eastern shore of the Bay, so we sped past the island and tried to find suitable turtle grass beds closer to the shore, but the wind had the water so churned up, we couldn't even see bottom. I suggested that we simply "bite the bullet" and go where everyone else was.

And so it was close to 11:30 before any of us got our mask, fins and snorkels on and hit the water, ready to get some scallops. Considering the fact that the Shenks had scalloped there before, I expected that they would quickly start finding them. As we did a circle around the grassy area where we had anchored in about five feet of water and met back at the boats, I saw their bags were as empty as mine. They shook their heads as if to say, "We don't know where they are, either."

So I swam off towards a shallower spot where I could see several people holding big bags of scallops. I stuck my head under water repeatedly, but didn't see a thing. Finally I just swam up to the nearest person and asked how the heck he had found so many scallops. His technique was simplicity itself: He would walk barefoot over the grass in sort of a sliding motion and when he encountered a hard object, he'd reach down and invariably come up with a scallop. He explained that these particular scallops liked to be down deep in the thickest parts of the turtle grass.

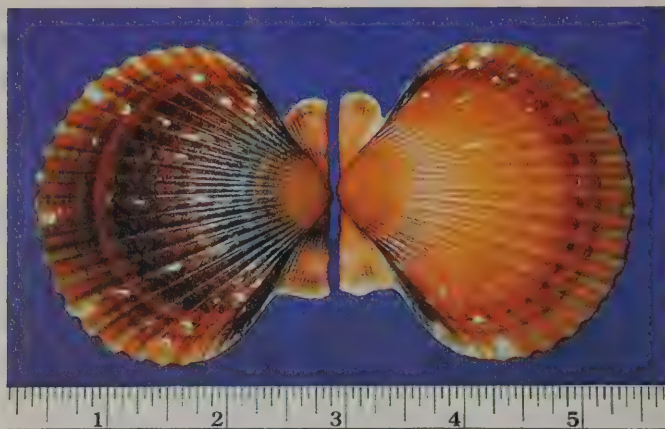
While his technique made sense, it also seemed to me to be the perfect way to encounter a stingray or one of the rather large resident crabs, so I decided to take his advice, but use my eyes and hands rather than bare feet.

Well then, having learned the secret, I went under water for a look. As I carefully parted the thick grasses so as not to churn up the bottom, I was immediately rewarded with the sight of an *Argopecten irradians*. And not just a typical gray specimen! Instead this was a bright orange one! Now somewhere in the back of my mind was the information that *A. irradians* were sometimes orange and rarely yellow, but I hadn't fully registered the fact until then, and I certainly didn't expect to find one.

I moved on and within minutes was finding scallops everywhere. Despite the large number of people out that day, it appeared there were plenty of scallops for everyone...and then some. I was literally grabbing handfuls and popping them into my mesh collecting bag.

Returning to the boat to drop my catch into the cooler, I saw that I had not only two more orange *A. irradians*, but also a yellow one! That was quite a thrill, but at that time I had no idea that it would be the only yellow *A. irradians* I would find all summer. Meanwhile, the Shenks, following my instructions, were scooping up scallops left and right and within minutes were back at the boat to add their booty to our catch.

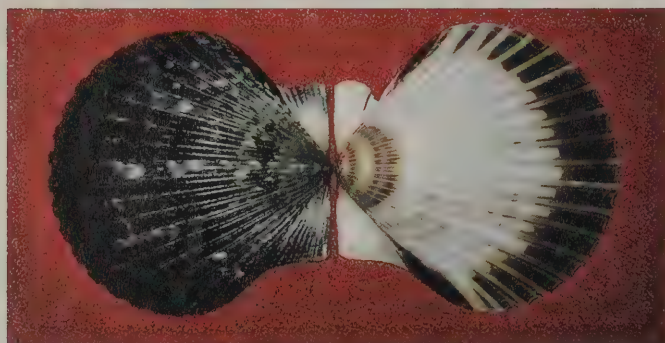
Now I mentioned earlier that I wasn't expecting much from the gray *A. irradians*, but the orange specimens and one yellow had me hooked. Still, as the others were carefully shucking the scallops so as not to damage the shells (using a bent steak knife), I examined the normal specimens. These were both larger than the *A. irradians* I had encountered before (most just over two inches), but also seemed to have more of a pattern, though it was hard to tell since the valves were covered with algae and other natural camouflage. I scrubbed with my



A large orange *A. irradians* from St. Marks Wildlife Sanctuary.

fingernail on a specimen to remove some grunge and saw bright white rays on what appeared to be a dark gray, almost black background. Hmm, maybe I had misjudged this species.

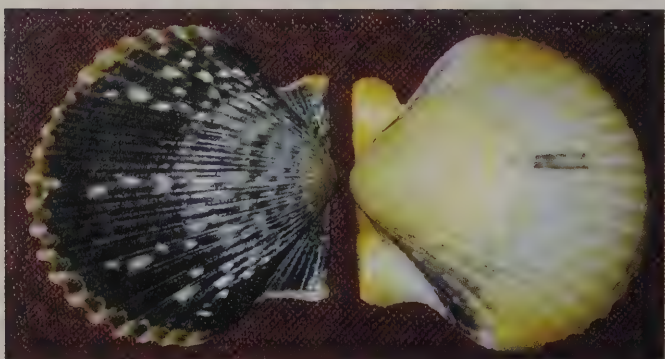
We continued our scalloping until we had our legal limit (scallop-
ing requires a salt water fishing license and there are strict penalties for
exceeding your limit). During the course of our hunting, we found sev-
eral good-sized tulip shells and a few *Busycon sinistrum*, though we
didn't keep any of these.



A 56 mm. banded *A. irradians* from St. Joe Bay.

After a quick lunch, we decided to head off to the area where the
horse conchs had been found the previous year. Unfortunately, with
the wind still blowing rather strongly, the water was too murky for us
to spot anything on the bottom. We stopped at a few likely-looking
spots and spent a while exploring, but the only find was a *Phyllonotus*
pomum (Apple Murex), which was making a meal out of a Bay
Scallop.

By about 3:30 that afternoon, with the wind gusting even higher,
we headed back to Eagle Harbor. I didn't think I had much of a haul,



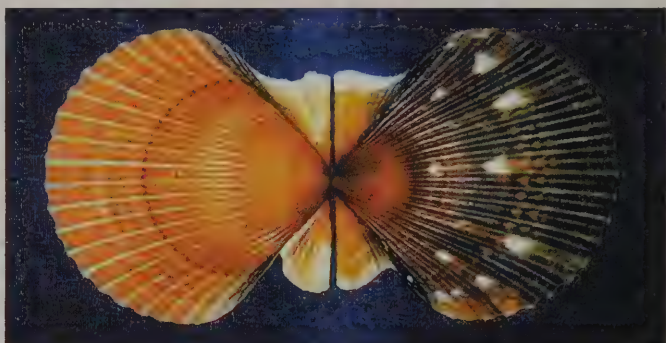
Yellow *A. irradians*



53 mm. yellow *A. irradians* from St. Joe Bay.

a small bucket of scallops and one Apple Murex, but it had been fun
and I knew we could always come back later in the summer. Again we
stayed overnight in Apalachicola. We drove back to Tallahassee the
next day, stopping to make a run out to Dog Island, but the wind made
the trip unpleasant, with no hope of doing any diving or snorkeling, so
we just decided to go on home.

Once there, I dumped the empty scallop shells into some bleach,
and within half an hour I began to see the true beauty of the shells
under all that marine growth. The scallops were nothing like what I
had seen before. These shells were surprisingly nice, with bright white



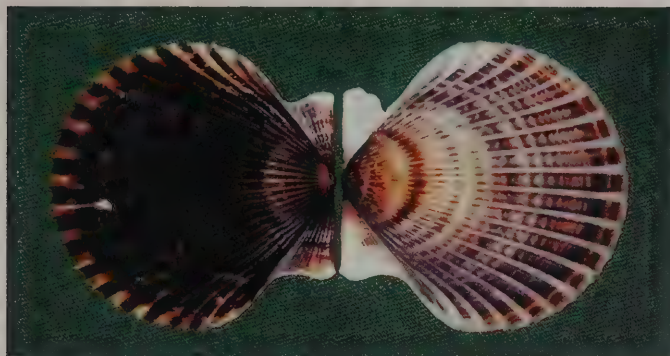
55 mm. orange *A. irradians* from St. Joe Bay.

spots and stripes on a charcoal gray or brownish black background.
The lighter side (plain white in the shells I had seen before) displayed
a variety of markings, from those with a few tan splotches at the
umbones to others heavily patterned with dark browns, deep yellows
and blue-grays.

After a good scrubbing with a stiff wire brush and a fast dip in a
very diluted solution of muriatic acid, I was stunned at how beautiful
these shells were. No two were alike and the orange and yellow spec-
imens were utterly spectacular (at least to my eyes). I knew then that I
had to go back again to see if I could find more of the colorful spec-
imens, as well as some of the more heavily patterned "typical" shells.



54 mm. orange *A. irradians* from St. Joe Bay.



A 68 mm. *A. irradians* from St. Marks Wildlife Sanctuary

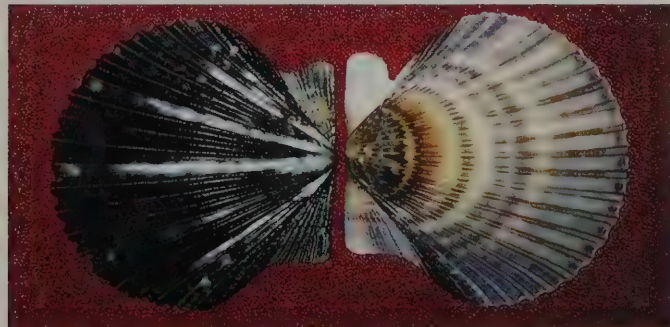
Fortunately, I didn't have to wait long. A few weeks later we returned to the same spot, half expecting that few scallops would be left considering how many people were out scalloping this year. Even the newspapers reported record numbers of scallopers, so we were pleasantly surprised to find there were almost as many shells as the last time we had been there.

We began at Black Island about 9:00 AM. By 11:00 AM, however, a nasty thunderstorm came up and we huddled under the boat's Bimini top and ate lunch. It was still raining at noon, but by then the tide had dropped so low that many of us were literally stranded in the shallow water, other boats actually lying completely high and dry on sandbars. But with the water only a few feet deep in most spots, we were able to walk across the grass flats in the rain, picking up scallops when we saw some or bumped into them with our feet (in old boat shoes, of course, since earlier a young boy had to have a rather large, ill-tempered crab removed by force from his foot).

About an hour later, the tide had come back in enough that I could drag the boat across the flats and out into deeper water, and though it was still drizzling, we went off to explore some new areas. Close to the west shore of the bay, we actually found what must have been hundreds of scallops literally sitting right on top of the turtle grass. As I approached them, they would squirt water into the air and try to bury themselves down in the grass. We also found a small *Pleuroploca gigantea* (which I didn't take) and a nice yellow *Busycotypus spiratum* (Pear Whelk) which I did keep.

In the sandy areas close to shore there were many empty scallop shells from previous visitors who had caught them and shucked the scallops on the spot, then discarded the shells. I could take all the shells I wanted here without feeling guilty about killing the little critters, so I tossed back a lot of the scallops we had gotten around Black Island, except for the orange ones and a few specimens that appeared to have spectacular patterns.

Finally the sun came back out and we took a lazy path back to Eagle Harbor, enjoying the warmth and the clear water. We didn't find much else, but we did interact with some pelicans along the way, then spotted a pod of dolphins farther out in deeper water, so we detoured over to greet them on our way back to the marina.



50 mm. *A. irradians* from St. Joe Bay



A Dog Ballard Reef *A. irradians* compared with St. Marks Wildlife Sanctuary specimen. Both shells are about 70 mm.

Within weeks I had started sending these shells to other collectors here in the U. S. and some overseas. All agreed that they had never seen such gorgeous *A. irradians concentricus*. One dealer even told me that these simply had to be *A. irradians irradians*, as the *A. irradians concentricus* were never this nice!

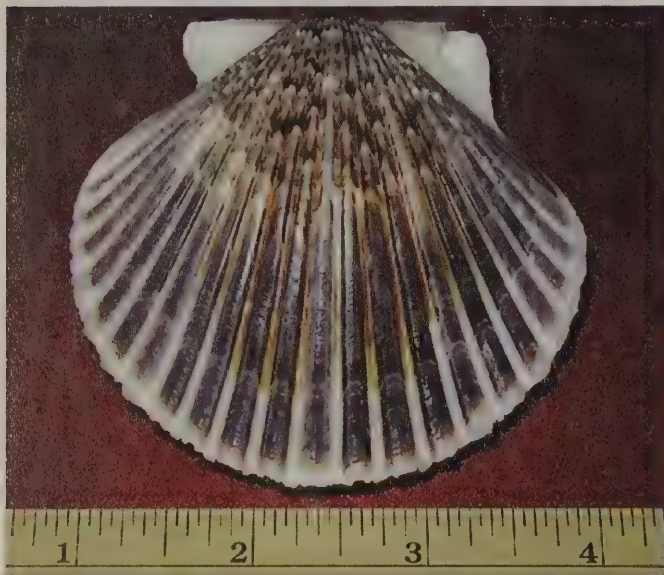
In late August, my wife's sister and her husband flew out to visit us. After our tales of scalloping St. Joe, they wanted to try their hand at it, so we made the journey back, spending the night in Apalachicola. Once out on the water, we were shocked to find almost no scallops at all around Black Island. Other boats were out, and everyone expressed surprise that so few scallops were present. We wondered if the scallopers had finally tapped out the resident population.

Moving to the southwest corner of the bay, in an area called Pig Island, we started finding a good number of scallops in shallow areas that had less dense beds of turtle grass. We also found huge numbers of empty shells. We spent the day cruising from spot to spot, but it turned out that there was only the one area that harbored many scallops at all. Again, other boaters stopped to ask us about the vanishing mollusks, but we had no answers. As a guess, I thought it might be related to the hot dry weather we were experiencing which had raised water temperatures to around the 90 degree mark, possibly driving the scallops into deeper, cooler water.



A. irradians from St. Joe Bay. 58 mm

When we got home, I called the Department of Fish and Game and after telling them about our lack of success in St. Joe Bay, I asked if they knew where we could find scallops. "St. Marks" was the answer. The person I spoke to said he had gotten his limit there within two hours. So the next day we packed our snorkel gear and a cooler of drinks and headed for the boat ramp right near the St. Marks light-house, just 35 miles south of Tallahassee.



A 79 mm. *A. irradians* from Dog Ballard Reef, collected at about 25'.



A 70 mm. *A. irradians* from Dog Ballard Reef from 25'.

You didn't have to be a genius to know where to look for the scallops—we just followed the line of boats headed for the most popular area. Once in the water, we immediately saw many scallops. We also noticed that these specimens were markedly larger than the ones we had found at St. Joe, several approaching the three-inch mark.

The grass flats at St. Marks are considerably different from those at St. Joe Bay. Not only is the water a few feet deeper, but many more types of sea grasses are present, and here the scallops seemed to prefer settling on the sandy or muddy spots among the grassy areas, a habit which made them quite easy to see in the clear water, even from the boat. We found quite a few nice large specimens (including sever-



A yellow *A. irradians* from St. Joe Bay. 53 mm.

al spectacular orange ones), and I even discovered a beautiful four-inch yellow sea horse clinging to some grasses. Everyone was in awe, since they had never seen a sea horse "in the wild" before. This little guy curled his tail around my finger and seemed quite content to stay there, but we wanted to try a few other areas, so we sent him back to his grassy home after taking some photos.

Despite the fact that scallop season had been officially open for almost two months, the number of scallops here was amazing. We also found a few nice *Fasciolaria tulipa* and even a colorful *Busycon sinistrum* in one of the deeper areas. Though we didn't find another yellow *A. irradians*, we found several in which the lower (lighter) valve was mostly bright yellow.

Once we returned home and cleaned our catch, we quickly saw that the St. Marks scallops were not only larger, but quite different in appearance. These specimens had more of a brownish coloration, and very few had the bold white rays and spots that the St. Joe shells displayed.

As summer (and scallop season) began to wind down, we hit St. Marks several more times and were shocked to find that there were actually more live scallops than we had seen previously. In some spots, you could dive down and pick up five or six in one spot, swim a few yards and pick up five or six more. They were quite literally everywhere.

(Continued on page 30)



Live specimen of an *Argopecten irradians*, with blue eyes looking out for Jim!

SHELLING IN ECUADOR

by José Coltro Junior

photos by Marcus V. Coltro

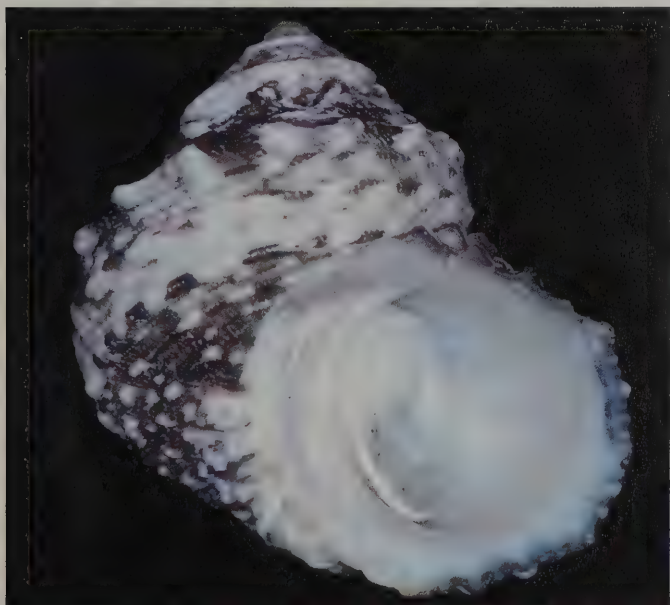


Our rocks—La Libertad, Ecuador

Part 1 Discovering Ecuador

For me, Ecuador has always been an attractive country to visit, especially now that I collect shells. Relatively small for a South American nation, with only about 12 million people, it has fantastic wildlife and all the different ecosystems—from arid flat zones on the southern coast to an exuberant rain forest on both sides of the Andes, as well as volcanoes and huge snowy mountains. It has an attractive local culture—including the Indians and their interesting life—and beautiful old cities, like Quito, with 500 years of history.

In October 1989 my brother and I started planning a foreign shelling trip. We never had done one outside Brasil, so we wanted to choose a nice place. Ecuador acquired a special attraction when we met a school teacher during our expedition to the Brazilian oceanic island, Trindade, who had good memories about his trip to Ecuador. He had brought many shells to give to friends, he told us, because “Some beaches are covered by shells—it is almost impossible to walk!”



Turbo saxosus Wood, 1828—La Libertad, Ecuador.

Femorale, Ltd. Cx.P. 15011, Sao Paulo SP Brazil 01599-970 Email: femorale@ruralsp.com.br

Our friends Ricardo and Gracy Guerrini wanted to travel with us. Making all the reservations was difficult back then; Ecuador at that time had few hotels, and we had a huge problem renting a car for the trip, since Ecuador has no border with Brasil. Even booking a flight was difficult because at that time only one weekly flight went to Guayaquil and Quito.

The first week of January 1990, we arrived in Guayaquil. What a shock! Guayaquil was a crazy, confusing, dirty city with unfriendly people; In a city like São Paulo we see no one but the police walking the streets with guns, while in Guayaquil we saw hundreds of private citizens carrying guns while standing at the doors of shops. Fortunately, we didn't plan to stay there, but to drive north along the coast to Salinas, which we'd been told was a great place. Of course, Avis had lost our reservation and had no car for us. When we presented our fax confirming our car reservation of a 4X4, they finally found (in about 4 hours) a very old car with the promise to give us a new one the following morning. In place of our 4X4, they gave us a 0.5x0.5 breakable car.

Off to a hot-waterless hotel. Dinner in a very ill-lit boat-restaurant in the Guyamas River was another bad experience. Seafood lovers all, we wanted to try a local food called “ceviche de concha.” Though it was too dark for us to see whether the utensils were clean, we could see that the ceviche was prepared in a black sauce—only Ricardo and I tried it. We discovered later that was the water from the bay caught inside of the shell (*Anadara similes*).



Left: *Cypraea arabicula*, *C. albuginosa*, *C. isabellamexicana*; right: *C. cervinetta*—La Libertad, Ecuador.

The following day was beautiful. Avis didn't have our car: “please wait until tomorrow.” We decided to take our breakable car and drive a little way to a beach called Las Playas (The Beaches). Although it was a workday, summer vacation had just started and the beach was full of people. Walking on the sand, we found our first shells – billions of *Olivella columellaris* (Sowerby, 1825), and some *Donax* and *Agaronia*. On the rocks we found *Fissurella*, *Acmea* and many *Purpura pansa* Gould, a first for us. We didn't have a bag so Gracy and I held the shells while Marcus and Ricardo collected other shells. Soon I smelt something bad, and then I noticed my hands were purple! Gracy's too. I thought I'd just wash them and everything would be fine—well, Gracy and I had purple hands until the end of the trip....

Finally I got our new car and we started for Salinas. We found it a nice tourist town with long sand beaches—not the place for us. Local people told us about the next town, La Libertad. There we found a nice hotel over a small harbor with some rocky reefs in the front. It was late



Cypraea cervinetta—Ecuador

afternoon so, putting our stuff in the room, we went immediately to the beach. Even with a high tide we easily found shells, like *Turbo saxosus* Wood, 1828. We went to bed very excited.

Early next morning after a quick breakfast (the hotel had a very good restaurant), we went immediately to the rocks. Our dream came true. The place was full of shells: a huge number of species, like *Cypraea cervinetta*, *C. robertsi* and *C. arabicula*, millions of Columbidae, lots of Turridae. We snorkeled over 6 hours!

At lunch time everyone at the restaurant was drinking a local juice, so I ordered the same—"naranjilla" juice. I drank probably 4 or 5 glasses of the delicious juice, even though the waiter tried to warn me that the juice was very strong. Later the results sent me to the bathroom for the rest of the day!



Live *Porphyrobaphe iostoma*—north of Manta, Ecuador.

Our shell finds were accumulating and needed looking after, so we shopped unsuccessfully for containers and alcohol. What to do? We bought a lot of "aguardiente," a local drink. The people in the hotel had thought the Brazilians were drunks but it worked reasonably well.

From La Libertad we made short expeditions to the small towns around. We went to Anconcito, in the south, an incredible place with thousands of tuna fishing boats. Most fisheries were on the beach, and the sand had small rivers of red tuna blood, where local kids were playing at making small blood sand holes. It was my most vivid memory of the entire trip.

We went north to San Pablo where we found shrimp boats, and on the beach, some beautiful big *Hexaplex radix*, *Phyllonotus brassica*,

Murex elenensis, and more. But we were developing a big problem—odors! Our short term solution was to put the shells in large buckets and cover them with sand. Gracy wasn't used to this kind of problem so we began to feel sorry for her and found some extra alcohol, mint flavor. Ricardo hates mint—any kind, but he agreed to use it so and we filled our containers.

One morning at "our rocks" in front of our hotel, Ricardo suddenly started to scream. We didn't understand what happened because Ricardo was screaming with the snorkel in his mouth. We ran to him, afraid that he had been bitten by a moray eel, but he was only screaming in astonishment at a huge *Conus fergusonii*. He had turned the *Conus* thinking it a rock!



Murex elenensis Dall, 1909—San Pablo, Ecuador.

We left La Libertad, planning to drive north to Manta. The unpaved road wasn't bad, but we had a problem—where to buy gasoline? It had been strongly recommended that we use only a specific gasoline, "Super 92," but we couldn't even find a gas station! Everywhere we asked about "gasolinera," people said "just few kilometers" behind or ahead. But we couldn't find any and our fuel was going fast. We began to worry where we would stay or how we would call Avis. Ecuador had no public phones in rural areas. Most towns had no electric power or water and few people used the roads.

Finally we stopped at a poor wood house at the roadside to ask about a gas station (Please, God!); the man told us that the "gasolinera" was there. "Where?" we asked. "Here," said the man. The scene: 4 Brazilians despaired talking with a small local Indian—by the way, we were a public attraction everywhere we stopped: two skinny white guys (Marcus and Ricardo), a Japanese (Gracy) and a tall, fat, but nice guy (me!). Well, the Indian opened a small wood room holding some



Hexaplex radix (Gmelin, 1791)—San Pablo, Ecuador.

large, rusty buckets full of gasoline. Super 92? Stupid question! At least we had solved the Ecuadorian gas station mystery.

Thanks to the gas problem we arrived in Manta late in the afternoon. The town had a normal gas station and we started to look for a hotel. We saw many warnings posted about a disease (hemorrhagic dengue) everywhere—not nice! Finally we found a reasonable hotel. When we took our luggage from the car we found that some of the containers had leaked the mint alcohol into Ricardo's luggage! He was wild! He complained a lot. Ricardo is Italian-Brazilian, like Marcus and I, but he normally speaks Italian and there is no better language in which to curse! We helped him to wash most of his "minty" clothes. Suddenly we heard Gracy scream. Running back, we found Gracy almost naked. She had showered but when she reached for the towel she found a huge cockroach on it!

We went to the only restaurant open in the entire city—not really nice, but we needed to eat something. We asked for chicken because we saw how they prepare other meats. (I will not describe that!) Marcus and I noticed cockroaches walking around; being discreet we killed them without Gracy noticing them. When the chicken arrived we almost couldn't eat—burned outside and raw inside! We had some chips and coke.

We decided to leave Manta early in the morning!

On the way north to Bahia de Caraquez Ricardo began seeing some white things on the tree trunks and bushes. I told him it was probably wasp nests. He insisted we stop and he was right—the white things were the beautiful land shell *Porphyrobaphe iostoma*! It was nice to collect them.

Bahia de Caraquez looked like a great place from the hills and we had some great surprises there. First the hotel—a beautiful, modern, and extremely comfortable one, on the beach with great views from rooms. Second, the town was clean, with public phone, supermarket, etc. But the best was the beach. An extremely long sand beach with lots of rocks and soft-rocks at low tide. We were able to drive on the beach and we covered more than 20 kilometers looking for shells. And we had lots of good luck!

We found many many species on the rocks and soft-rocks, and really nice *Oliva undatella ecuatoriana* and some *Agaronia* in the sand. It was super! Bahia de Caraquez was a prize after a really bad day.

One day while I was walking the beach collecting *Oliva* and *Agaronia* a young man asked me what I was doing. I explained and I offered him about 10 dollars to bring me these shells at the hotel. In the following morning he appeared in the hotel with a small bucket full of shells, most alive. When I asked about the dead ones, he told me that usually he and his family had no food and they collected those shells, boiled them in water with garlic and ate them. I was shocked! When I gave him 50 dollars, he was so happy! He told me it was more money than he had in an entire year! He asked if he could bring some more and I agreed, even though I had more than enough. I always learned that it is much more important to prize honest work than just give money for compassion.

The bay of Bahia de Caraquez has large mangroves around and lots and lots of shrimp farms. During most of the time we were there we saw hundreds of people in the sea using a very fine net to collect

shrimp larvae to sell to the farms. I asked how much they could make with this work and they told me if the entire family worked every day, in one month they could earn up to 20 dollars! In this moment I felt how enormous are the differences in Latin America.

Back to the shells! We decided to visit some small islets in the bay. At the port we tried to rent a motor boat. We asked a man who was ferrying passengers across the bay if we could rent his boat. The man answered, "I don't have a boat." Ricardo asked what he had, and he again denied having a boat. Ricardo, a very calm Italian, asked what that was under his bottom. He replied very calmly: I have a "panga" but I don't have a boat. For the locals "boat" is very large ship and "panga" is anything else. Finally we came to an agreement and the panga owner took us to the islets.

It was low tide and the panga stopped a little bit far from the islet. I jumped out and I found a really muddy bottom. It was disgusting walking on that. In the dry area we found many shells, especially *Rhynocoryne humboldti* and large *Natica*. The islet had some typical mangrove vegetation with large *Littorina*. We had some company around—boys looking for bivalves to sell at the market.

I saw some beautiful sea-birds on the vegetation and I decided return to the boat alone to get my brand new camera. I was alone on my way to take a picture of the birds. Everybody had returned to the boat. I saw a small pocket of water and decided to jump it. I sank in the mud to my breast! I couldn't move because in one hand was the camera I didn't want to destroy and I was alone! I started to scream to the boat but it was far away and very windy. I saw some of the kids so I screamed to them. They came to help pull me out of the mud, no easy task when you carry some extra kilos.... Finally I gave my camera to them to hold and started crawling in mud until I found solid footing.

In the way back to the boat Marcus saw me from a distance and told Ricardo: I don't remember Jose wearing black long pants. I was so mad that I started to fight with Marcus like it was his fault! Of course Marcus started to laugh and everybody did the same, including me!

We left Bahia de Caraquez for La Libertad. We decided to stay there our last two days before flying to Quito. We cleaned most of the shells, packed everything, and left La Libertad extremely early in the morning for the Guayaquil airport.

When we arrived Avis was closed so we couldn't return the car. So we parked the car in front of Avis and took the keys to Quito where we had another Avis reservation. But guess what? Avis-Quito didn't have a car for us! Same story—they had no reservation but we had a confirming fax. They promised a car in two days. We had only a day to see Quito, so we finally got another car from Hertz so that we could to visit Quito. We went to see the fantastic pre-Colombian collection in the Museum in the Central Bank, including a wonderful gold mask.

In the afternoon we went to Otavalo, about 1 hour north of Quito. The town is very famous for local handcrafts. Along the way we visited the Ecuador (Equator) mark called "La Mitad del Mundo" (Middle of the World). The road around the huge Andean mountains is gorgeous, and we had a beautiful day. We left Ecuador extremely happy. Aside from some small confusions, the trip was wonderful and we'll always have good memories from there.

Next time: **Rediscovering Ecuador 1995**

OOPS!

Apologies to Marcus Coltro. Marcus, and not José, was the photographer who was responsible for those gorgeous shots of tiny Brazilian shells! His lovely photography and Ross Gundersen's immaculate algorithmic photo editing combined to produce a stunning set of illustrations for José Coltro's March article on Brazilian deepwater shells. (P. 4-5)

Board Talk...

From Doris Underwood, COA's Membership Director: MOVING? Please notify the Membership Director in the event of a change in your address (or name) promptly. Magazines sent by bulk mail are not forwarded by the Post Office. Do not write to the magazine! Thanks!

Doris Underwood, Membership Director.
698 Sheridan Woods Drive
West Melbourne, FL 32904-3302
Email: underwood@yourlink.net

THE OLD SHELL GAME

by Paul Monfils

When Is a Bivalve Not a Bivalve?



Terebratalia transversa (Sowerby), a common species from western North America. One of the more colorful brachiopods.

When it's a brachiopod! Brachiopods, commonly known as "lamp shells," are a phylum of marine invertebrates possessing a calcareous bivalved shell, superficially resembling those of bivalved molluscs. In fact, these strange animals were not recognized as distinct from molluscs until the middle of the nineteenth century. The shell and the thin outer periostracum of a brachiopod are secreted by the mantle, just as in molluscs. However, should you open the shell of a living specimen,



Terebratulina septentrionalis (Couthouy), a common shallow water brachiopod from the northern Atlantic.

61 Osborn Street, Providence RI 02908 Email: Paulcyp@aol.com
Pmonfils@lifespan.org

you would realize at once that the creature resting in your hand had little in common with a clam. Most of the shell's interior is occupied by the lophophore, a two- or three-lobed fleshy structure covered with minute, sticky tentacles which capture microscopic plankton from the ocean water and pass it to the central mouth. The shell valves of brachiopods are oriented dorsally and ventrally (upper and lower), rather than bilaterally (left and right) as in molluscs. Some molluscan groups such as *Pecten* (scallops), *Spondylus* (thorny oysters), and *Ostrea* (oysters) give the impression of an upper and lower shell; but their internal anatomy reveals that the valves are actually arranged bilaterally, and the animal lives its life lying on one of its sides (the left side in *Ostrea*, the right side in *Spondylus* and *Pecten*). The ventral valve of most lamp shells is larger and more convex than the dorsal, and is usually perforated near the umbo by a hole, or foramen, through which a cord-like stalk, the pedicel or peduncle, passes, anchoring the animal to the substrate.

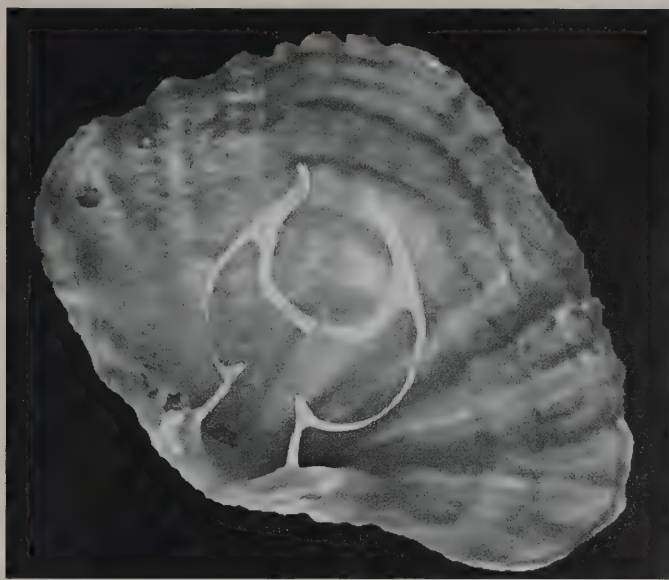
Lamp shells are one of the most ancient groups of animals. In fact, the genus *Lingula* is the oldest animal genus still represented by living species, having remained relatively unchanged since the Cambrian Period, some 600,000,000 years ago. Brachiopods appear to be on a long downhill slope toward extinction. Already abundant during the early Cambrian, they reached their peak of development in the Ordovician Period, 450,000,000 years ago, and have gradually become



Mucrospirifer sp., a fossil brachiopod from the Middle Devonian Period (age - 375,000,000 years)

less common in the fossil record since then. Over 30,000 fossil forms have been described, but only about 250 species remain alive today, sporadically distributed around the world as last remnants of once widespread animal groups tend to be. They inhabit both shallow and moderately deep water, but are seldom found off the continental shelf. Fossil forms 30 cm in diameter are known, but most are far smaller. The largest living species are about a third that size, and the majority of extant forms do not exceed 30 mm or so in width. Brachiopod shells may be smooth or ribbed, usually with concentric growth lines, and are occasionally sculptured with flutes or spines. Shell color typically ranges from grey through dull yellowish, but a few species are bright red or orange.

Two principle classes are recognized in the phylum—the Articulata, in which the shell valves are connected by a toothed hinge, much as in bivalve molluscs; and the Inarticulata, whose valves are held together only by the muscles and other tissues of the animal. Inarticulate brachiopods (*Lingula*, *Glottidia*, etc.) typically live in vertical burrows in the sand or mud. Their pedicel is long and thick, and contains muscle fibers, the contraction of which pulls the animal deeper into its burrow. The shell valves are roughly equal in size, relatively thin and often somewhat flexible, only moderately impregnated with calcium phosphate crystals.



Interior of brachiopod dorsal valve, showing the brachidium or lophophore skeleton.

Most specimens which reach the hands of collectors are of the articulate type (*Magellania*, *Terebratella*, *Terebratula*, etc.). The hinge of such a shell has several simple teeth, plus interlocking processes which prevent the shell from opening more than 10 to 15 degrees of gape. These projections also prevent disarticulation of the valves, except by breaking the hinge. The shells of articulate brachiopods are mineralized with calcium carbonate like those of molluscs, but are softer than most mollusc shells, and do not stand up well to bleach and other harsh cleaning agents. The inner surface of the dorsal valve is often specially sculptured to allow the lophophore to fit snugly against it. In many species, a delicate, calcified loop, the brachidium, extends from the hinge area of the dorsal valve into the shell interior, forming a support or internal "skeleton" for the large, soft lophophore. In some species, this structure is quite complex, with varied twists, turns, and branches, a wonder to behold. Unfortunately it is extremely fragile, and seldom survives the rigors of shell cleaning. Efforts to remove the soft parts of the animal through the narrow gap of the shell margin almost invariably result in shattering of the lophophore support. The chances of keeping the structure intact are

better if the hinge is broken and the shell opened wide, but even then it can be a challenge to remove all the soft tissues without damaging it. The large ventral valve of articulate brachiopods extends posteriorly past the margin of the dorsal valve, and its apex is often drawn out and reflected upward like the spout of a Roman oil lamp—hence the name "lamp shells." Because of this arrangement, the rather short pedicel emerges on the dorsal side of the shell. Consequently, in order to attach to the substrate, the animal must be oriented upside down, with the ventral valve facing upward. Articulate brachiopods are usually found on rocky or other hard surfaces. In both brachiopod classes though, a few forms have lost the pedicel altogether, and cement the lower valve directly to the substrate, much like an oyster. Such forms include the genera *Crania* (Inarticulata) and *Lacazella* (Articulata).

Even though many lamp shell species are locally common and frequently can be found in shallow water, many collectors are not familiar with them, because few books on seashells include them, and few shell dealers offer them. Still, a small assemblage of these unusual shells can make an interesting addition to a collection, particularly when the details of their natural history and ancient lineage are known.



Interior anatomy of an articulate brachiopod, showing the lophophore. Each radiating, bladelike structure is actually a group of fine tentacles adhering to one another.

LETTERS

Cone Wars

I wish to express my congratulations to Don Barclay for his enthralling account of the lives of cones, "Cone Wars." For a landlocked paleontologist in central Mississippi situated among Late Eocene marine outcrops with large, pristine fossil cones and several cowry species, Barclay's account brought the fossils to life. I've always wondered how a cone with only specialized harpoon-like teeth evacuates another mollusk from its shell, a task difficult even for a person with tools. According to Barclay, they not only do this, but then drag their fat gut back into the narrow confines of a cone shell. After reading "Cone Wars," I suspect that one way fossil cones were preserved in our Eocene sediments was by burying themselves (digging their own graves) after falling prey to an attack by another cone.

Sincerely,

David Dockery III

Mississippi Dept of Environmental Quality, Office of Geology
P.O. Box 20307, Jackson MI 39289-1307

Petit Reply

Dear Mr. Calamai:

I was somewhat surprised to see in your letter on page 2 of the current issue of *American Conchologist* (March, 2000) that I "suffer from a geographical blind spot—and a huge one."

My statement was simply that A-4 binders are not commonly available in the US. Never having attempted to purchase one in Canada (or in any other countries) I did not elaborate on the subject. My object was to give my opinion of the merits of the work; the comment on availability of a binder was secondary.

I make no claim to be free of error and welcome having mistakes pointed out so that I do not make them again. However, the reason more articles by me do not appear in *American Conchologist* and other popular publications is because of unwarranted criticisms such as yours.

Richard E. Petit

r.e.petit@worldnet.att.net

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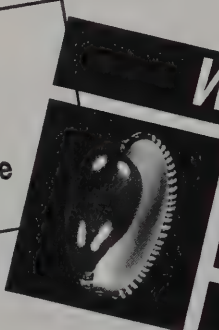
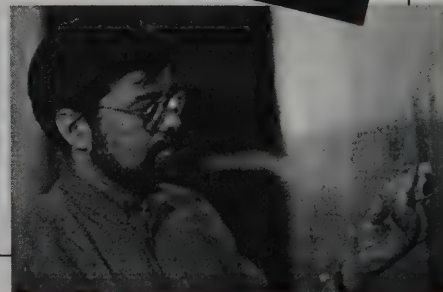
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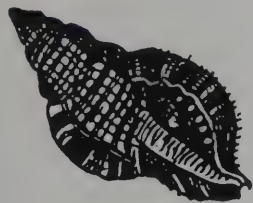
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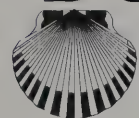
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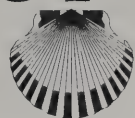
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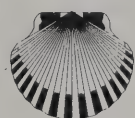
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A CONFUSING MURICID SPECIES FROM THE WESTERN ATLANTIC

by Emilio García

Last January I received from Dick Forbush, the well known Florida collector and past president of C.O.A., an unnamed muricid species dredged in 1964 in 180-200 ft. of water west of Cape Romano, south-west Florida. Dick knows I like to "play" with unidentified species so he could not have given me a better present.

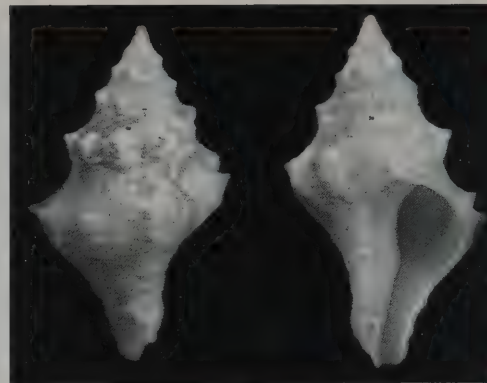
My initial reaction when I saw the specimen was that it must be an *Acanthotrophon* because of its similarity to the Panamic species *A. sentus* Berry, 1969. However, as soon as I started checking my literature at home I found the species in an article in which Dr. Emily Vokes (1976) treats the muricine genus *Attiliosa*. The specimen was identified as *Attiliosa striata* "Gabb." Oh, well, I thought, I am wrong one more time.

Two days later I was talking to Emily on the phone and mentioned "my" finding, and how similar it was to an *Acanthotrophon*. Her reply was: "IT IS an *Acanthotrophon*," and she quickly directed me to a later publication (1992). And then the mystery began to unravel. It seems that in her 1976 publication only one of the specimens identified as "*Attiliosa striata*," the holotype, was really that species; all of the others were different. Even the genus "*Attiliosa*" for that particular species was two years later changed to *Acanthotrophon* by Radwin and D'Attilio (1978), so the species became *Acanthotrophon striatus* (Gabb, 1873).

The confusion continues: when Dall (1889) described the taxon "*Muricidea*" (= *Attiliosa philippiana*), he included in the type lot two

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specimens. The problem was that they belonged to two different species. One was eventually chosen by Dr. Vokes as the lectotype of *Attiliosa philippiana* and the other, a superficially similar species, was a specimen of the same species

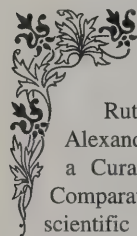


that appeared misidentified in Dr. Vokes' 1976 publication. Now we have a species identified as "*Attiliosa philippiana*" and as "*Attiliosa striata*," but is neither of them. What to do. What to do. Very succinctly put, that problematic species, pictured in this article, is now known as *Acanthotrophon striatoides* Vokes, 1980. It ranges from southern Florida to Brazil. However, as far as I know, all recent shells have been found either in southern Florida or in Brazil, with no stations in between.

Due to all the nomenclatural confusion cited above, the wrong names for the species in question have appeared in a number of popular publications, such as Rios (1975, p. 86, pl. 24, fig. 350), as *Poirieria pazi*; Radwin & D'Attilio (1976, p. 26, pl. 3, fig. 10), as *Attiliosa philippiana*; Kaicher (1980, fig. 2574), as synonymous with *Attiliosa philippiana*; Rios (1985, p.83, pl. 29, fig. 363), as *Paziella pazi*; and Sunderland and Sunderland (1993, p. 14), as *Attiliosa philippiana*. A very good picture of *Acanthotrophon striatoides* appears in Houart (1994, p. 63, fig. 155).

REFERENCES

- Houart, R. 1994. *Illustrated catalogue of recent species of Muricidae named since 1971*. Verlag Christa Hemmen, Wiesbaden, Germany, 179 pp.
 Kaicher, S. D. 1978. *Card catalogue of world-wide shells, Pack no. 25, Muricidae, Part V, nos 2498-2603*. Publ. by the author, St. Petersburg, Florida.
 Radwin, G.E. and A. D'Attilio. 1976. *Murex shells of the world; an illustrated guide to the Muricidae*. Stanford University Press, Stanford, California, 284 pp., 32 colored pls., 192 text figs.
 Rios, E. C. 1975. *Brazilian marine mollusks iconography*. Museu Oceanográfico, Rio Grande, RGS, Brazil, 331 pp., 91 pls.
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 Sunderland, K. and L. Sunderland. 1993. Caribbean muricids: *Amer. Conchologist*, v. 21, no. 4, pp.14, 15, illus.
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 ———. 1992. Cenozoic Muricidae of the western Atlantic region. Part IX- *Pteryonotus*, *Poirieria*, *Aspella*, *Dermomurex*, *Calotrophon*, *Acantholabia*, and *Attiliosa*, additions and corrections. *Tulane Stud. Geol. Paleont.* 25(1-3): 1-108.



RUTH DIXON TURNER 1914-2000

Ruth Dixon Turner died on Sunday, April 30. She held the Alexander Agassiz Professorship at Harvard University and was a Curator of Malacology in the University's Museum of Comparative Zoology where she also served as co-editor of the scientific journal, *Johnsonia*. She graduated from Bridgewater State College, earned a Masters degree at Cornell University and a PhD at Harvard/Radcliffe under the direction of Dr. William J. Clench who brought her to Harvard from the Clapp Labs in Duxbury.

Turner, who had begun her scientific and teaching career in a one room schoolhouse in Vermont, went on to become the world's expert on Terebratulids, bivalved mollusks called shipworms. These marine borers cause widespread destruction by eating wood in the ocean environment, destroying piers, docks, and wooden boats. She became known affectionately as "Lady Wormwood" for her work in this field. It was she who explained why there was little wood left on the sunken liner *Titanic* when it was discovered by fellow scientist Robert Ballard.

During her career which spanned some five decades Dr. Turner kept laboratories in La Parguera in cooperation with the University of

Puerto Rico, Northeastern University's Marine Sciences Institute at Nahant, the Marine Biological Laboratory at Woods Hole and Harvard. Her work led to collaboration with the United Nations Food and Agriculture Organization, the U.S. Navy Office of Oceanography which funded much of her research, and the Woods Hole Oceanographic Institution where she became the first woman scientist to utilize the Deep Submergence Research Vehicle ALVIN to study the deep sea. Over some two decades she participated in several dozen oceanographic expeditions. The Oceanographic Institution later named Turner a "Women Pioneer in Oceanography."

She received many other honors, including a number of honorary degrees and a recent election into the Women Divers Hall of Fame. The venerable Boston Sea Rovers, an ocean education group of which she became an esteemed member, named her "Diver of the Year," and in recognition of her accomplishments the U.S. Navy dedicated their book on "Biodegradation in the Sea" to Professor Turner. Other book dedications noted that she was a "Biologist par Excellence" and quoted her oft repeated motto, "Know your animals."

Dr. Turner's last major project was as a member of the scientific team that investigated the wreck of the *Central America*—a sunken steamer that contained millions in lost gold. A Federal judge called it

2000 SUMMER & FALL SHELL SHOWS AND MEETINGS

by Donald Dan, Awards Director

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College du Gran Pont, Lutry, Switzerland
Dr. Ted W. Baer, CH-1602 La Croix, Switzerland
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- Jul. 8-9 **Townsville Shell Show**
Townsville, Queensland, Australia
Cutharinga Bowls Club on Harold Street, West End
Glenda Rowse, 19 Farrell Street
Kirwan 4814, Queensland, Australia (77) 732-817
- Jul. 7-12 **American Malacological Society/Western Society of Malacologists Joint Annual Meeting**
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Terry Gosliner, California Academy of Sciences
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E-mail: tgosliner@calacademy.org (415) 750-7277
- Jul. 15-16 **Jacksonville Shell Show**, Jacksonville Beach, FL
Brampton Inn, Jacksonville Beach
Carol Rishel, 2115 Beach Avenue
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- Jul. 18-23 **Oregon Shell Show**, Portland, OR
Oregon Museum of Science & Industry, Portland
Maxine Hale, 347 N.E. 136 Avenue
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- Aug. 18-20 **Jersey Cape Shell Show**, Stone Harbor, New Jersey
Wetlands Institute, Stone Harbor
Jersey Cape Shell Club, P.O. Box 124
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- Sep. 8-10 **North Carolina Shell Show**, Pine Knoll Shores, NC
North Carolina Aquarium at Pine Knoll Shores
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- Sep. 23-24 **Annual German Shell Fair**, Essen-Heidhausen.
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(201) 401 107; Fax: 49 (201) 224 541
- Oct. 20-22 **Seashell Searchers Shell Show**, Brazosport, Texas
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- Oct. 8 **British Shell Collectors' Club Shell Show**
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Kevin Brown, 12 Grainger Road
Isleworth, Middlesex TW7 6PQ, England (181) 568-8333
- Nov. 4-5 **Philadelphia Shell Show**, Philadelphia, PA
Academy of Natural Sciences, Parkway & 19th St.
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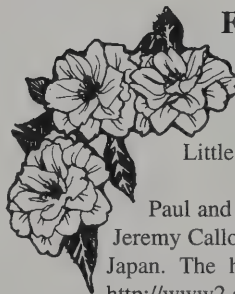
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the most scientifically studied shipwreck ever. She was a past president and beloved member of the Boston Malacological Club. She was also a president of the American Malacological Society and was designated as a lifetime honorary president. Dr. Turner provided leadership to these organizations and guidance to their members who study seashells and other mollusks. She was a Director of the Marine Ecology Project and a consultant to many organizations including the National Geographic Society and its programs on deep sea vent systems. Lecturing widely, she shared her knowledge and love of the sea and its life. A dedicated teacher and skilled dissectionist and illustrator, Turner was a mentor to hundreds of students around the world. She trained people, opened doors for them and watched proudly as they started out on their own careers.

Dr. Turner leaves her sisters Winifred Garrity and Lina MacNeil. She is predeceased by her parents, her brothers Henry and Arthur, and sisters Jessie, Mary, and Frances. Contributions are being accepted to a Memorial Fund that has been established in her name at the Woods Hole Oceanographic Institution; donations may be made to: Ruth Turner Fund, c/o Fenno House, Woods Hole Oceanographic Institution, Woods Hole, MA 02543.

—George D. Buckley

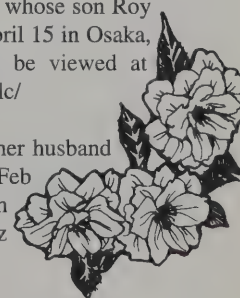
Flowers to....



Tom and Renee Watters on the birth of their second son, Ian Michael Watters at 11:25 AM Tuesday March 14, 2000. Little Ian weighed in at 6 lb. 8 oz.

Paul and Sayuri Calloman, whose son Roy Jeremy Callomon was born April 15 in Osaka, Japan. The happy family can be viewed at <http://www2.gol.com/users/paulc/>

Debbie Wills, COA's webmaster, and her husband Steve. They became grandparents on Feb 22. The new little angel is Sarah Elizabeth Wills, 21" long and 8 lbs 12 oz



COA TROPHY WINNERS

by Charlotte Lloyd



Our congratulations to Jake and Sylvia Dominey for their award winning exhibit, "Xenophoridae." The COA Trophy was presented to them at the Central Florida Shell Show on Jan. 22-23. Their 40-foot exhibit displayed in 22 cases held a majority of the family with educational information and pictures. Wow!



At the British Shell Collector Club's Annual Shell Show on October 30, 1999 Kevin Brown was the grand winner of the COA Award. His exhibit entitled "Millennium Musings on Molluscs" reflected how once 'rare' shells have become available with changing collecting techniques and improved travel. Kevin is shown receiving the award from Mrs. Joyce Cox.

Elizabeth Brown's exhibit, "Why Do They Call Them Pen Shells," enchanted judges Wayne Harland and Chris Takahashi and won her the coveted COA Award at the Greater Miami Shell Show on Jan. 29-30. The world-wide Pinnidae exhibit included growth series, photos, maps, drawings, fossils and a Pinna pearl. This exhibit also won the "Most Beautiful Shell" for her *Pinna carnea*. Good job, Elizabeth!



Harry Berryman (left) received the COA Award from Philadelphia Shell Club President, Nick Ruggeri, at their Show on November 6-7, 1999. Harry's exhibit, entitled "Limpets in the Evolutionary Tree," contained approximately 170 species (450 specimens) in 20 feet of exhibit area. Congratulations, Harry!

AMS-WSM in San Francisco

The joint meeting of the American Malacological Society and the Western Society of Malacologists will be held at San Francisco State University July 7-12, 2000. AMS and WSM will sponsor three symposia: The Place of Malacology in Comparative Biology, convened by Michael Ghiselin, California Academy of Sciences; Systematics and Ecology of Opisthobranch Gastropods, convened by Angel Valdes, California Academy of Sciences, and Advances in the Study of the

Behavior of Recent and Fossil Cephalopods, convened by Roland Anderson of the Seattle Aquarium.

The meeting will include a banquet at the California Academy of Sciences and the AMS Annual Auction (literature). Optional field trips include excursions to Mt. San Bruno with Neil Fahy, Monterey Bay Aquarium with Angel Valdes, and Pt. Reyes National Seashore and Mt. Tamalpais with Terry Gosliner.

For further information, email: ams-wsm@calacademy.org or go to http://www.calacademy.org/research/html/malacological_meeting.html

COA TROPHY WINNERS

by Charlotte Lloyd



Approximately 2,500 visitors attended the Marco Island Shell Show and viewed Peggy William's Award winning exhibit. Peggy showed her self-collected chitons from around the world, including many species with the girdle, underside views, and collecting and preserving methods. Another fine exhibit by this exceptional collector. Good job, Peggy!



Dotty and Lowell DeVasure won the COA Award for their exhibit, "In Search of Shells," at the Sanibel-Captiva Shell Show on March 2-5. This exhibit highlighted the personal development of shell-collecting, the friends made, trips taken and the wonderful shells found. A favorite exhibit of the more than 1,000 visitors to this popular Show! Congratulations on a job well done!

OOPS!

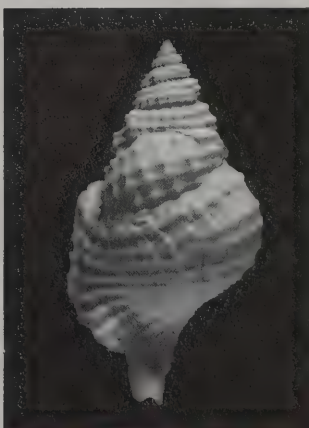
A gremlin scrambled the last three species in the March centerfold, Kevan and Linda Sunderland's Bursidae and Personidae of the Western Atlantic. The photo labelled *D. mcgintyi* is *D. robinsoni*, *D. perdistorta* is *D. mcgintyi* and *D. robinsoni* is *D. perdistorta*. Corrected captions are with the photos below. Our apologies to the Sunderlands!



Distortio constricta mcgintyi Emerson & Puffer, 1953. 52 mm. 240', by shrimp off south side of Key West, FL.



Distorsio perdistorta Fulton, 1938. 52 mm. 170 fms., by shrimp, off south side of Key West, FL.



Distorsio robinsoni Petuch, 1987. 78 mm. 35 m., by shrimp off Punta Petuca, Honduras.



For color! "centerfold" this issue, please see pp. 28-29.

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MALACOLOGISTS MEET ON BOTH COASTS:

Mid-Atlantic Malacologists Third Annual Meeting

by Tim Pearce

22 mollusk enthusiasts in the Delaware area converged in Wilmington, Delaware on 12 February 2000 for the third annual meeting of the Mid-Atlantic Malacologists (MAM). The meeting, hosted by Dr. Tim Pearce, was held at the Delaware Museum of Natural History. Participants at this one-day gathering included professional, amateur and student malacologists, shell collectors, and a government worker. People came from the states of Delaware, Maryland, New Jersey, and Pennsylvania. Interests of participants spanned the major Molluscan groups: gastropods, bivalves, and cephalopods. The numerous conversations throughout indicated that the meeting succeeded in its goal to allow malacologists to connect with each other.

We had eight lively presentations:

Harry Berryman — *Xenophora* attachments are not for camouflage, but to keep the animal's nose out of the mud; and commentary on the new *Xenophora* book. Despite a few mistakes, it is still a terrific book; use it with caution, though, because the classification may change again after Dr. Simone in Brazil finishes his studies on *Xenophora* biology.

Tim Pearce — Update on Delmarva Peninsula Land Snail Survey. Has found numerous new county and state records; e.g., of 52 species in New Castle County, 32 are new county and 27 are new state records. The distribution maps are of interest to conservation organizations tracking rare species, and governmental organizations trying to prevent spread of invasive species.

Betty Jean Piech — A hybrid *Charonia* specimen? What is a species, anyway? As would be expected, the question of what constitutes a species sparked a lively discussion. The biological species concept (breeding true) is popular, partly because it incorporates the concept of gene flow, but one cannot conduct breeding experiments on fossils, or on empty shells, and asexually reproducing organisms lack gene flow. Another definition says that a species is whatever a competent taxonomist says it is. However, a lumpers and a splitter may both be competent but would classify specimens into species very differently.

Aydin Orstan — *Truncatella* from Florida: how many species? *Truncatella pulchella* and *T. caribaeensis* have consistently distinct shell morphologies (the former with striated nuclear whorls and a duplex adult lip). The species co-occur in two distinct habitats: on rocks near the sea, and under piles of seaweed farther from the sea.

Liz Shea — Tentacle development in the squid family Ommastrephidae. The two tentacles are separate in very young squid and in older individuals, but surprisingly, squid about 3 to 7 days old have the two tentacles fused. Histology shows the fusion is complete while it lasts, and despite a line visible on the outer surface, there is no inner indication where the two tentacles joined, or where they will split again.

Video by Alan Grant of Laguna Beach, California (not present) — Nudibranchs of the Philippines: superb close-ups of colorful nudibranchs meandering in their native habitats.

Robert Robertson — Slides of Great Malacologists. Robert's slides from decades gone by gave a delightful walk down memory lane of 31 great malacologists past and present. Included were H.B. Baker, Philippe Bouchet, Arthur Cain, Mel Carriker, Vera Fretter, A. Graham, S.J. Gould, Joe Houbbrick, Dr. Hubendick, Alan Kohn, H. Lempka, Jim McLean, T. Okutani, Winston Ponder, Bill Rudman, Norman Runham, Dr. Russell-Hunter, Howard Sanders, Rudolf Scheltema, Amelie Scheltema, Anatoly Schileyko, Alan Solem, Gunnar Thorson, Simon Tillier, Ruth Turner, Gerry Vermeij, Tom Waller, Anders Warén, Wendel Woodring, Ellis Yochelson, and Charles Yonge.

Charlie Sturm — History of the Carnegie Institute Mollusk Collection, Pittsburgh. There have been about five curators since the late 1800s, times at which curators have been absent include the present. The most recent curator, Juan Jose Parodiz, has been emeritus for 19 years. The museum intends to hire a curator this year. Notable collections at the Museum are Eastern North American land snails from George H. Clapp, Victor Sterki's fingernail clams, Ortmann's unionids, and Ohio land snails from Stanley Brooks and Gordon Kuchka (=G. McMillan). The collection is 44% terrestrial, 17% marine, with the rest freshwater.

After the presentations, many participants took the opportunity to examine specimens in the extensive mollusk research collection at DMNH.

Attendees at MAM 2000 were Jeff & Belinda Beck, former members of Wilmington Shell Club; Harry Berryman, studies *Xenophora*,

and now Meters; Lillian Berryman; Al Chadwick, volunteer at DMNH, curating his shell collection he donated; Andrea Gathers, DMNH; Nancy Godfrey, Bryn Mawr University; Judy Goldberg, Philadelphia Shell Club, works with *Epitonium*; Joe Hagan, volunteer at DMNH, interested in miters Anthony Italia, DMNH, Land Snails of Delmarva Project, also interested in entomology; Elaine McDonald, Philadelphia Shell Club; Aydin Orstan, studies land snails of Maryland and Turkey; Tim Pearce, DMNH, Land Snails of Delmarva Project; Betty Jean Piech, volunteer at DMNH, shell collector since 1960; John Plummer, Port of Wilmington, working with introduced pest land snails; Happy Robertson; Robert Robertson, Curator of Malacology Emeritus at Academy of Natural Sciences since 1988; Liz Shea, of Bryn Mawr University, studying early life history of squids; Charlie Sturm, volunteer at Carnegie Institute, working with upper Cenozoic fossils; Bruce Saunders, Bryn Mawr, interested in Nautilus; Sam Tuttle, of Middletown, DE, amateur collector; John Wolff, North Museum in Lancaster, PA, curates the mollusk collection.

MAM, on the East Coast of North America, is patterned after the long-successful Bay Area Malacologists (BAM) meeting started by Gene Coan about 29 years ago in the San Francisco Bay area. Because MAM is only one day long, even busy malacologists are able to attend. Another factor contributing to MAM's success is its simplicity: there are no dues, officers, abstracts, or publications.

Enormous thanks go to Anthony Italia, Andrea Gathers, and Al Chadwick of DMNH for helping to make the meeting a success.

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SCUM IV: Southern California Unified Malacologists by Lindsey T. Groves

Thirty-six professional, amateur, and student malacologists and paleontologists attended the fourth annual gathering of Southern California Unified Malacologists (SCUM) in the Munk Seminar Room, Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, La Jolla, California on Saturday, 15 January, 2000. This informal association continues to meet on an annual basis to facilitate contact and keep members informed of research activities and opportunities. In order to keep these gatherings informal there are no dues, officers, or publications. SCUM has followed the successful format of the Bay Area Malacologists (BAM) and it was quite refreshing to see the formation of Mid Atlantic Malacologists (MAM) by Dr. Tim Pearce of the Delaware Museum of Natural History. It is hoped that the continuing success of these informal gatherings will encourage the formation of other regional groups of professional and amateur malacologists and paleontologists.

SCUM IV host Hugh Bradner was unfortunately stricken with an untimely case of laryngitis and attended the gathering with little to say. Substitute hosts Larry Lovell (Scripps Institution of Oceanography) and Terry Arnold (San Diego Shell Club) welcomed the guests and updated everyone on recent happenings. As with previous gatherings, all attendees were given an opportunity to briefly present details of their current mollusk related research and/or activities (see summary below). Numerous discussions and comments resulted from many of the presentations. SCUM V will be hosted by Mr. George E. Davis, Crustacea Section of the Natural History Museum of Los Angeles County, at the museum in January of 2001.

SCUM IV participants and their respective interests and/or activities: **Yvonne Albi** (Conch. Club Southern Calif.)— Researching extinct (Jurassic through Cretaceous) rudistid bivalves that produced reef-like structures.

Terry Arnold (San Diego Shell Club) — Research on fossil cypraeoideans of s. Australia. Recently collected specimens at Muddy Creek area, Victoria, Aust.

Hans Bertsch (National University) — Slides of alcohol preserved nudibranch specimens. Reported that deepest record for a nudibranch (*Bathydoris*

ioca): 2800 meters, Isla Guadalupe, Baja California, Mex. Announced 2001 WSM meeting in San Diego.

Don Cadien (L.A. Co. Sanitation Dist.): Interested in benthic infaunal and microbiota surveys in the Southern California Bight.

Tom Demere (San Diego Nat. Hist. Mus.) — Update on current construction project at SDNHM to accommodate Recent and fossil invertebrate collections. Continues salvage paleontology from construction sites throughout San Diego County.

Wes Farmer (San Diego Shell Club) — Recent CD-rom entitled Eocene flora, fauna, and crystals of Torrey Pines State Beach, result of previous years of documentation.

Dan Geiger (Nat. Hist. Mus. L.A. Co.) — Recently completed Ph.D. dissertation at USC on abalone phylogeny. Accepted post-doctorate position in the Molecular Systematics Lab at LACM to develop phylogeny of scisurellid gastropods.

Lance Gilbertson (Orange Coast College) — In addition to teaching duties, a survey of Urocoptid and Helminthoglyptid land snails of the arid southwest U.S. continues including new species descriptions based primarily on anatomy.

Lindsey T. Groves (Nat. Hist. Mus. L.A. Co.) — Research on eastern Pacific cypraeoideans and Caribbean cypraeid genus *Muracypraea* (with Terry Arnold). Continues compiling companion volume to Keen & Benton's (1944) *Check list of California Tertiary marine Mollusca* (with Richard Squires and Louella Saul).

Carole Hertz (San Diego Shell Club): Editor of *The Festivus*. Recently published revision of type specimens described by S. Stillman Berry as *Festivus* supplement. Completed Panamic *Fusinus* work with Joyce Gemmel and Barbara Myers; plans work on Panamic turrids.

Jules Hertz (San Diego Shell Club) — Examined micromollusks from grunge samples from Bahía Magdalena, Baja California Sur, Mexico; will report findings in *The Festivus*. Studying the Panamic species *Colubraria ochsneri* and a possible range extension to Isla del Coco, eastern Pacific. Reported that Carol Skoglund (Phoenix, AZ) will update her past Panamic supplements of *The Festivus*.

Kim & Linda Hutsell (San Diego Shell Club) — Continues with revisions to the *Registry of World Record Size Shells* with Don Pisor.

George Kennedy (San Diego St. Univ.) — Continues salvage paleontology operations in northern San Diego County. Eocene localities of interest produced well-preserved oysters, soft-shell turtles, crocodilian teeth and scutes, land mammals, and petrified wood. Of particular interest: mollusk specimens replaced with gypsum.

Larry Lovell (Scripps Ins. Oceanog.) — SIO Collection Manager with a primary interest in Polychaetes. Led tour through new SIO collection rooms facilities.

John Ljubenkov (Pauma Valley, CA) — Interested in benthic infaunal surveys and population trends, particularly near sewer outfalls.

Kristina Louie (Univ. Calif. Los Angeles) — Researching population genetics of eel grass populations of the northeast Pacific (with David Jacobs). Taxa of particular interest are the limpet *Tectura depicta* and the sea hare *Phyllaphysia taylori*.

Jim McLean (Nat. Hist. Mus. L.A. Co.) — Continues book of northeast Pacific shelled gastropods; completed difficult families Pyramidellidae and Cerithiopsidae.

Mike Miller (San Diego Shell Club) — Presented slides, particularly of nudibranchs, from a recent trip to the Visayan Sea area of the Philippines.

Dave Mulliner (San Diego Shell Club): Recently completed photography of *Zoila* specimens for Barry Wilson's book on that cypraeid genus.

Louella Saul (Nat. Hist. Mus. L.A. Co.) — Researching Cretaceous bivalves and gastropods. Has begun a revision of the gastropod genus *Volutoderma* ranging from northern Baja California, Mexico to Vancouver Id., British Columbia (with Richard Squires of Calif. St. Univ., Northridge).

Bill & Nancy Schneider (San Diego Shell Club) — Update on their fossil collecting from Pleistocene Mulege terrace deposits near Mulege, Baja California Sur, Mexico. Provided Recent and fossil shell specimens for a new Mulege community museum.

Roger Seapy (Calif. St. Univ., Fullerton) — Encouraged attendance at the WSM joint-meeting with the AMS at San Francisco St. Univ. in June. Continues research on heteropod mollusks of eastern Pacific.

Kent Trego (San Diego Shell Club) — Slides of Deception Island expedition, South Shetland Is., Antarctica, documenting benthic faunas; devastated by volcanic activity in the 60's and 70's; area rapidly repopulated by invertebrate fauna.

Also attending but not reporting were Janice Abdulian (Pacific Shell Club), Mark Bellows (San Diego St. Univ.), Hugh Bradner (UC San Diego), Scott Jordan (Pacific Shell Club), Kay Klaus (San Diego Shell Club), Sammy Kram (Pacific Shell Club), Phil Liff-Grief (Pacific Shell Club), Megan Lilly (Marine Biology Lab San Diego, CA), Margaret Mulliner (San Diego Shell Club), Travis Smith (UC San Diego), Barbara Tan (Pacific Shell Club), and Cecilia Williamson (Chula Vista, CA)

Another Museum in Danger

Museums of the world are much beleaguered with rising costs and increasingly and expensively stringent standards for collection storage. Natural history is not always the first receiver of available funds either. Museum closings and consolidations are becoming increasingly common worldwide. Now the National Museum of Natural History in Montevideo, Uruguay is in trouble. It needs a new building and the government has been unable or unwilling to provide one. Now the building is being closed and the collections are being placed in storage as a temporary solution. Responsible museum personnel feel the storage conditions provided are likely to damage the collections, with high humidity and water leaks. Fabrizio Scarabino and Alvaro Soutullo fscara@inape.gub.uy, urge us to fax our concern to the Uruguayan president, Dr. Jorge L. Batlle at any of the Uruguayan embassies: New York (718) 212/753-1603) Miami (305) 443-7802 Los Angeles (310) 394-5140 Chicago (312) 642-3470.

Vacation Warning

With summer vacation season upon us, it is a good time to remind ourselves that Florida has marine collecting laws and requires a marine collecting license, called a recreational salt water fishing license. The laws are complex enough that many marine patrol officers do not seem to know the exact specifications of the law. Better safe than sorry. Learn the law and be sure to stay on the safe side of it. It could be enforced differently from one marine patrol district to another.

Also, be warned that Fort Myers Beach is now requesting a ban on the harvesting of live mollusks within the city limits. At this time no determination has been made.

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CONCHATENATIONS

by Gary Rosenberg

Ecophenotypic Variation in Mollusks

Perhaps you've heard stories about remarkable similarities between identical twins separated at birth. When reunited years later, they discover that they both wear their socks inside-out and collect sinistral seashells. Studies of such pairs of twins have led to measures of the degree of heritability of different traits in humans. We also know that it is virtually impossible for adults to learn to speak a new language without a foreign accent, but that young children can easily do so. This is because of developmental plasticity: The brain of the child becomes wired for the sounds it commonly hears. If a language has no distinction between "l" and "r" sounds, the child loses the ability to hear the distinction. In humans, the ability to learn language is inherited (genetic), but which language is learned is determined environmentally.

In mollusks, as in humans, the interaction between genetics and environment is complex, and it can be difficult to sort out their relative roles in causing the variation that is seen within and between populations. Sorting them out is important, however, when trying to understand whether different forms represent different species. In my column on "Mollusk Species in Practice" (*American Conchologist* 27(2):20-21, Sept. 1999), I noted that differences between species must be genetically based. Different species must have different "genotypes"; if they differ only in "phenotype" (appearance), then they are not different species. The molluscan literature has many examples of environmental influences on appearance, which include temperature, salinity, availability of moisture, substrate, diet, predators, parasites, or pollution affecting one or more of size, color, pattern, shape, sculpture, and anatomy.

The phenomenon is known as "ecophenotypic variation," "phenotypic plasticity," and "developmental plasticity." These terms are most often used by paleontologists, ecologists, and neurobiologists, respectively. They also proceed in that order from most general to most specific. "Ecophenotypic variation" implies nothing about mechanism; "phenotypic plasticity" implies that the result is adaptive, that is, the plasticity itself results from natural selection and is an adaptation enhancing the organism's ability to survive; "developmental plasticity" implies irreversibility because of early commitment to a particular developmental pathway, as in the linguistic example above. Although plasticity is adaptive, not all ecophenotypic variation is adaptive. Some species of snails when exposed to the pollutant tributyl tin develop false penises in females, which can lead to sterility. This is clearly maladaptive, a short-circuiting of developmental pathways; the snails were not exposed to tributyl tin at any prior time in their evolutionary history and so could not have evolved a response to its presence. (The additive, tri-butyl tin, leaches out of paint to prevent marine fouling organisms from settling on painted surfaces.)

Because plasticity is adaptive, the phenotypic results of plasticity can mimic the results of natural selection. Suppose that animals blend in with the plants they feed on, but are different colors in different populations because of different dominant plant species. This may be the result of natural selection eliminating animals that don't blend in, or of the animals incorporating pigments from their food. Natural selection will cause both the phenotypes and the genotypes of these populations to differ; plasticity will cause only the phenotypes to differ. To determine whether variation is due to genetics or environment, it is usually necessary to do transplant or captive rearing experiments, a number of which I will now describe.

Ino (1949, 1958) found that shell color in the Japanese turban shell

Turbo cornutus depends on the type of algae that it is fed. On a diet of brown algae, it produced white shell, on red algae, it produced normal greenish brown shell. In conducting his feeding experiments, Ino took specimens normally exposed to rough waves and kept them in a protected experimental pond. This induced them to stop growing spines. The transition in sculpture and color is quite abrupt, as shown in Figure 1. The spines in *Turbo cornutus* presumably protect the shell if it is dislodged in heavy surf. A spine will likely be the first thing to hit a rock, and a broken spine is less injurious than a broken whorl. But why stop making spines in calm conditions? To save energy, which instead can be put into reproduction, thereby increasing the chance of offspring making it into the next generation.

Ino (1952) also found that coloration in some Japanese abalone depends on diet, a result replicated by Leighton (1961) for the Red Abalone in California, *Haliotis rufescens*. He found that red shell was deposited when the animals were fed red algae, and white or green shell with brown or green algae. (Note: red, brown and green algae are taxonomic groupings and do not necessarily reflect the color of the algae). An interesting result with the feeding experiments in *Turbo* and *Haliotis* is that banded shells can be produced by switching the diet back and forth. This shows that the changes in the physiological state of the animal are reversible, even though the color of a particular band of shell is not reversible. Therefore these changes are better classified as phenotypic plasticity than as developmental plasticity. However, these changes are not necessarily adaptive: Leighton showed that Red Abalone produces a pale green shell when fed boiled potatoes or yams and a cream colored shell when fed agar or boiled carrots. Therefore the more neutral "ecophenotypic variation" might be preferred until camouflage or some other adaptive function is demonstrated.

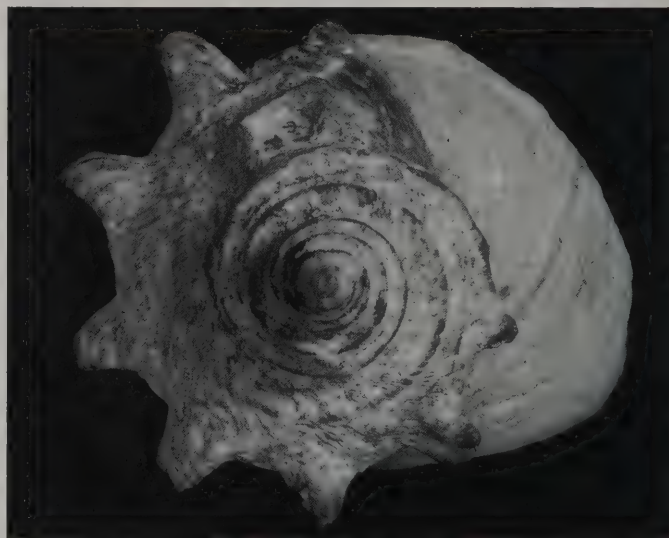


Figure 1. Transplanted *Turbo cornutus*.

Another important environmental factor is salinity. Gundersen & Minton (1997) showed that *Peperita pupa* in freshwater have a pattern of black with white spots, but in higher salinity have white with black stripes. (Figure 2) Nalesso et al. (1992) showed by transplant experiments that the mussel *Brachidontes darwinianus* from estuaries in Brazil varies in morphology with salinity. In low salinities, shells are higher, have intact periostracum, and many radial ribs; in higher salinities, the shell is longer, the periostracum is eroded, and radial ribs are lacking. Crowding of shells might also affect shape in this case.

In *Nucella lapillus*, the presence of predatory crabs induces changes in morphology. On coasts exposed to severe wave action *Nucella* generally has a light-weight shell with a broad aperture. The broad aperture accommodates a broad foot that is better at adhering to

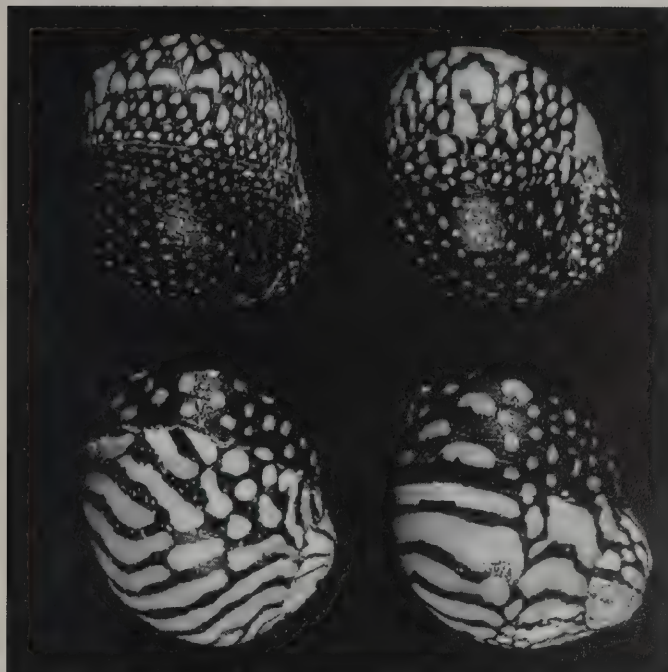


Figure 2. Transplanted *Puperita* pupa. Photo by Ross Gundersen

the rocks. In sheltered areas, shells are robust with small apertures to resist crab predation. Palmer (1990) induced these changes by holding snails in aquaria physically separated from the crabs, but connected by water-flow, thereby showing that the snails use water-borne chemical cues to detect the crabs. In a similar experiment, Appleton & Palmer (1988) found that a related species, *Nucella lamellosa*, develops larger apertural teeth in the presence of predatory crabs. Trussell (1996) obtained similar results with *Littorina obtusata*, finding that snails raised in the presence of crabs develop significantly thicker shells. Reimer & Tedengren (1996) found that *Mytilus edulis* raised in the presence of starfish were significantly smaller in length, height and width, but had significantly larger posterior adductor muscles and thicker shells, and that these changes made them better able to resist predation by starfish, which took longer to open the valves.

Martin-Mora et al. (1995) transplanted juvenile *Strombus gigas* among sites in the Exuma Cays, Bahamas. Animals from the source population had long-spined, bulky shells. After eight months, the still juvenile conchs more closely resembled members of their "foster" population, being, for example, slender with short spines. The morphological changes correlated with composition of the substrate, although the exact mechanism of induction was not determined.

Substrate can also affect radular morphology. Padilla (1998) showed that *Lacuna* feeding on kelp have sharper radula teeth than those on eelgrass, which have blunt teeth. The sharp teeth let *Lacuna* remove kelp tissue, whereas the blunt teeth let them scrape microalgae from the eelgrass surface. This is not simply a matter of different patterns of wear, because the differences can be seen at the non-feeding end of the radula when the teeth are first produced. Morphology of radular teeth is often used as a species-specific character, frequently on the basis of extracting a radula from a single individual or a few individuals of one population. Clearly studies of many individuals from more than one population are necessary to characterize the range of variation in radulae.

How can one deal with the problems that phenotypic plasticity presents for defining ranges of variation within species? Transplant and laboratory experiments have not been done for most species, and given the number of mollusk species, they likely never will be done. However, natural experiments exist: animals that show a change from

one morphology or color to another within the shell. I have seen this in some ovulids, where a shell changes from yellow to purple, indicating that it moved from a yellow to a purple seawhip. The range of morphologies known to result from ecophenotypic variation in well-studied species can also be a guide as to what to expect in related species. Also, since mollusks usually do not exhibit irreversible phenotypic plasticity, it is likely that a range of intermediates can be found if enough material is studied. As usual, more study is needed!

Acknowledgment: Robert Robertson kindly assisted in assembling relevant literature.

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Trophy Winner



Gene Everson's self-collected worldwide shells were the subject of a COA Award winning exhibit, "Shells of the '90's," at the Palm Beach County Shell Show March 24-26. Gene's purpose was to encourage shell collecting by showing that, despite shelling prohibitions, habitat destruction, and pollution, good shells are still out there.

PHOTOGRAPHY OF SHELLS

by Ross Gundersen

American Conchologist Photographic Editor

Greetings from your friendly photographic editor, also known as DD (Digital Dipstick). I'm the one who takes your prized pictures and prepares them for publication. I have put together this primer on important photographic techniques in photo-documentation of shells for enjoyment as well as for research/ publication. These techniques can be applied to both traditional photography and the rapidly expanding capabilities of digital photography. This is not an exhaustive work, but a beginning point. There is a tremendous learning curve to get the most out of your camera, lenses, lighting setup, and computer.

Why Photograph Shells?

I photograph shells because I want to. It's a joy to see the details of a smaller shell magnified onto an 8" X 10" print. Take, for instance, *Chama florida*, relatively small and finely detailed. Just looking at the shell, we cannot appreciate its fine details. We can use a magnifying loupe, but then we are just looking at a small part of the shell. When it's photographed we can easily see the shell's finely detailed foliations in all their magnificence. I have found that identifying small shells is much easier when looking at a large photograph than through a magnifying loupe or microscope. An additional benefit: you can incorporate a small picture of a shell into your data base.

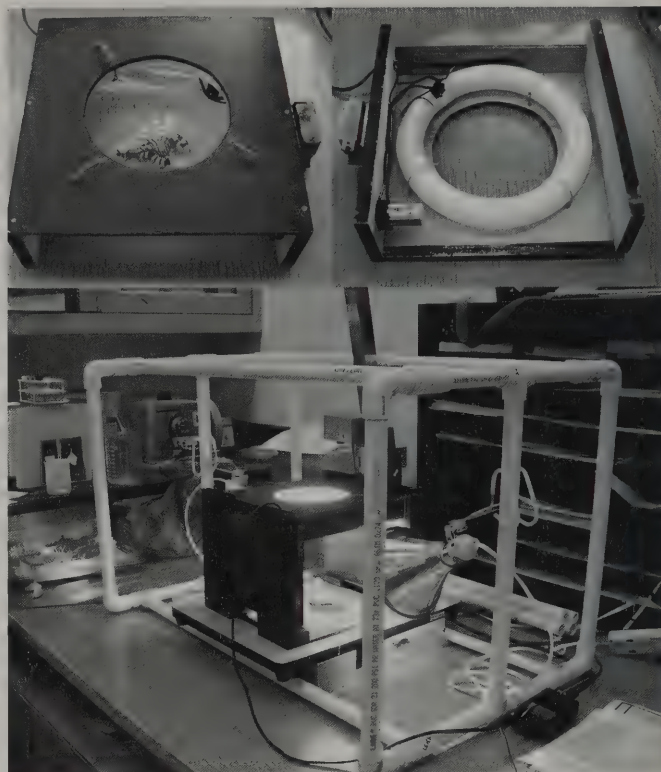
Camera:

A tremendous array of different cameras is on the consumer market. The most common camera is called "point and shoot," with a viewfinder for framing shots, an autofocus zoom lens, and automatic exposure. This type of camera can be used for taking pictures of large shells, but let's face the facts, most shells are relatively small, 2" or less. Another type is the single lens reflex (SLR). With this camera you frame shots and focus through the camera lens. In addition, SLRs usually have interchangeable lenses which accept closeup lenses and extension tubes to enlarge the image. This is the commonly preferred camera for shell photography, because what you see is what you get (within reason). The third type of camera is digital; it has a viewfinder and LCD viewing screen for framing shots. When using the LCD, "what you see is what you get." The lens is usually a permanently attached autofocus zoom lens which can accept closeup lenses. Recent technological advances have produced digital cameras which are beginning to challenge SLR cameras. I find that digital cameras can take excellent pictures of shells.

Lenses:

To obtain high resolution (finely detailed) images you must first start with the correct lenses. Standard lenses, capable of producing acceptable images, are not designed for close-up photography. Lenses for close-ups are designated as "macro" lenses, highly corrected and specifically designed for what is also termed macro-photography. Choose lenses with dedicated focal lengths such as 55 mm and 105 mm, while avoiding macro zoom lenses which don't have the resolving power of dedicated focal length lenses.

Macro lenses are designated: e.g. 1:1 or 1:4. This means the lens will project onto film or CCD a life-size or one quarter life-size image without the aids of close up lenses (diopters: +1, +2, +4) or extension tubes. To obtain larger images (increased magnification), use close up lenses or extension tubes. Close up lenses allow you to get closer to the shell. Choose multicoated close up lenses to reduce reflections between the lens surfaces. Extension tubes, fitted between the lens and the camera body, magnify the image on the film plane. For extreme macrophotography you can reverse mount another lens onto the lens



The upper panels show the construction of my circular fluorescent light used for uniform illumination. The bottom shows the frame used to position lights. In this picture two halogen lights and the circular fluorescent light are being used.

affixed to the camera body. For example, attach a normal 50mm lens onto your 100mm telephoto lens. To do this you need a lens reversing ring. The choice among these three options depends upon how small a shell you wish to photograph.

To photograph micromollusks you enter the range of "micro" photography, using even greater magnifications, and so requiring the use of a dissecting microscope. Mount your camera onto the microscope, using the microscope lenses as the camera lens, making it easy to attain magnifications of 30X. As with regular camera lenses, you must have a microscope with lenses capable of high resolution. This means an inexpensive dissecting / binocular microscope won't work as well as a more costly one.

Focusing:

Focusing the image on the film plane can be problematic, even with autofocus cameras; an out-of-focus image will not appear sharp and little can be done about it. But this is changing! The problem with focusing is that you are either looking at a small SLR image on a focusing screen or a small LCD monitor on a digital camera. To our eye an image can look in focus when it is not. The small focusing image doesn't show us all the detail we use for critical focusing. Get around this problem in two ways, depending on the type of camera you use. With an SLR camera, purchase a small lens which magnifies the image on the focusing screen or, a drastic solution, you can modify the focusing screen. This last option is not for the faint hearted. Purchase a plain ground glass focusing screen and, using Canadian Balsam, affix a microscope cover glass to the screen. Reducing the granularity of the screen allows for a more detailed image. If you want to try this option contact me for further details.

With a digital camera I suggest focusing using a video monitor. Magnifying the screen image is not practical and results in a magnified image composed of small squares. However, most digital cameras

come with a video port to attach them to a television so you can attach your camera and focus using the greatly magnified image on the TV screen.

Copy Stands:

Macrophotography not only magnifies the shell image, but also magnifies any camera or shell vibration. In short, a small vibration becomes a large vibration, blurring the image on the film plane. Keep both camera and shell as vibration-free as possible by using a heavy duty copy stand. Affix the camera to the copy stand, placing the shell on its base. In principle, both the shell and camera vibrate the same way since they are affixed to the same copy stand. These vibrations will not show up on the film plane. But if the camera vibrates differently from the shell, the vibration will show up, especially at high magnification. To eliminate this difficulty, place the copy stand on a stable, heavy platform and place some foam rubber between the platform and the base of the copy stand. Higher shutter speeds also reduce vibration artifacts and are linked to the amount of light used.

Lighting and Film:

Films and CCDs require specific light levels to perform optimally. Under-illuminating a shell will result in a grainy image of low resolution and inaccurate color rendition, while over-illumination will burn out detail in the brightest areas of the image. You must determine the light level required for best performance of the film or CCD. Take a series of pictures at varying light levels to determine optimal light level. This step can be time consuming and expensive when using traditional film.

Lighting can be of 4 types: daylight, flash, tungsten, or fluorescent. Indoors we rely on flash, tungsten or fluorescent. Combination of lighting and film determines shutter speed and color rendition. Commonly available film types and digital camera CCDs perform with best color rendition in daylight (~5500 K) or flash. Light sources which duplicate daylight are relatively costly. Using flash units gives you high light output, but you can't see the quality of lighting until you have the negative or print in hand. You may take hundreds of photographs of shells of differing sizes and geometry before you have a standard placement for your flash units. The main advantage of flash illumination is good color rendition and high light output, coupled with higher shutter speeds which reduce vibration artifacts.

Using tungsten or fluorescent lighting are still viable alternatives. With these light sources, what the eye sees in terms of illumination is what the camera will record. However there is a trade-off in color rendition and lower light output. Tungsten light produces a reddish cast

while fluorescent is bluish-green. Handle this by using filters to adjust the color balance of light entering the camera. Balance tungsten light with 80A and 80B filters; fluorescent requires FL-D (fluorescent day-light) or FL-W (fluorescent warm-white) filters. Handle the lower light output with a good, heavy-duty copy stand to reduce vibration artifacts. The author should point out: professional films, balanced for use with tungsten and fluorescent light sources, are available, but they cost more than regular film and require special processing.

Three types of light sources are routinely used: tungsten photographic light bulbs, fiberoptic halogen/tungsten and fluorescent light fixtures. A good copy stand comes with adjustable fixtures for using tungsten photographic light bulbs, providing excellent lighting for larger shells. Fiberoptic sources are good for directional illumination of smaller shells and micromollusks since the units come equipped with easily positioned goose-neck fiberoptic cables. My fluorescent source is a circular fluorescent bulb (hardware store variety) mounted in a wooden frame. The circular light source provides 360 degree diffuse lighting, resulting in an even illumination for both larger and smaller shells.

Directional illumination enhances surface detail by providing shadows produced by an uneven surface. This type of illumination is a must for micromollusks in which small surface details are of great importance for taxonomic purposes. With larger shells, surface irregularities are more pronounced so a more diffuse or even lighting can be used. The coupled use of directional and diffuse lighting can be used to great effect on larger shells to provide even illumination and enhance small surface details.



The effects of light levels on color rendition and grain size. Both pictures were taken with tungsten light with an 80A filter. At low light levels color rendition suffers greatly and grain size of the image increases obscuring detail.



T: tungsten light, T + F: tungsten light using an 80A filter, FL: cool white fluorescent light, FL + F: cool white fluorescent light using an FL-D filter.

To achieve the best directional illumination, your light sources must easily be moved and positioned. For me this meant: "Off to the hardware store!" or "I'm cheap and can't afford off-the-shelf lighting systems." I constructed a framework of 3/4" pipe onto which can be clamped my halogen and fluorescent light fixtures. The framework is constructed to fit around my copy stand and the horizontal pipes are interchangeable to increase or shorten the length of the framework. The light fixtures are standard, accepting halogen bulbs and with attached clamps. I place the shell on a piece of glass supported by a black wooden frame. When in operation this setup can be quite impressive. It will be holding 4 halogen light sources, a circular fluorescent fixture and a fiberoptic light source! People visiting me when I am taking pictures are really impressed, but always ask what I am taking a picture of. I point with great glee at a 2mm microgastropod. They usually leave shaking their heads in disbelief.

Different film speeds are available (ASA/DIN/ISO) for traditional film and higher end digital cameras. Film speed relates to the sensitivity of the film to react with light. Lower film speeds require more light, while higher film speeds require less light. You have to match the film speed with your lighting intensity. With lower film speeds you will need a more intense lighting to avoid slower shutter speeds which increase the chances of vibration artifacts. In addition you may have to use lower f stops, decreasing your depth of field (see **Depth of Field**). Higher film speeds require less light. With the higher speed films you can use higher shutter speeds and F stops which reduce vibration artifacts and increase depth of field.

Traditional films also have what are called different grain sizes. "Grain size" refers to the physical size of the light-sensitive chemicals in the film. Slower speed film (e.g. ASA 25) has a smaller grain size compared to higher speed film (ASA 200). The film grain relates to resolution or sharpness of the film. A slower film has the ability to cap-

ture greater amounts of detail compared to a higher speed film. Digital film also has a grain size, but it is fixed and relates to the size of one pixel (one light sensitive element).



The effect of f-stop on depth of field. The fronds, designated by arrows, are in focus at f 11, but not at f 4. The area marked by an asterisk is in focus at both f 4 and f 11. Notice that at f 11 the entire shell is in focus.



Focus series of *Z. pulchellum* in which all parts of the shell are in focus in at least one photograph.



Selected regions of the focus series used to create the final composite.

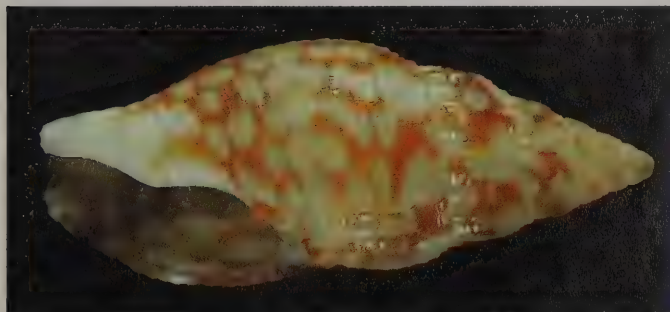
Depth of Field:

The bane of Macrophotography and Microphotography is depth of field. As magnification increases, the thickness of the shell, or depth, which is in focus decreases. When taking pictures of large shells, depth of field problems are usually not as noticeable. As the size of the shell decreases and magnification increases it rapidly becomes apparent that not all of the shell is in focus. In short, one picture cannot get all of the shell in focus. Standard camera lenses and high end digital cameras have variable F stops which adjust the light entering the camera. As the F number increases, the amount of light entering the camera decreases while the depth of field increases. To increase the depth of field and use higher f stops, one has to use higher light levels with higher shutter speeds to reduce vibration artifacts. However, a point will be reached at higher magnifications where you are using the highest F stop and all of the shell is still not in focus. Now you have reached the limits of traditional photography and must use the digital technique called compositing.

Using a microscope in microphotography, in lieu of traditional lenses, produces real depth of field difficulties. The microscope has no F stops to increase depth of field. Even at 10X magnification, depth of field will be very shallow and not all of the shell will be in focus. Once again the digital technique called compositing overcomes this difficulty.

Digital Compositing:

Depth of field limitations can be overcome by compositing the final image. Take a series of photographs with each part of the shell in focus in at least one photo. Depending on your camera type, film-based or digital, an additional step before compositing is necessary. Obviously, digital cameras produce digital photos while film cameras do not. If using film, you must scan the negative or print on a flatbed or slide/negative scanner to get it into digital format. Then you can composite the image. Load your images into an image processor like Paint Shop Pro or Adobe Photoshop. Both have a tool to select in-focus parts of each photo. Use these in-focus bits to reassemble the image. Now all of the shell will be in focus and the depth of field limitation has been circumvented.



Final composited picture of *Z. pulchellum*.

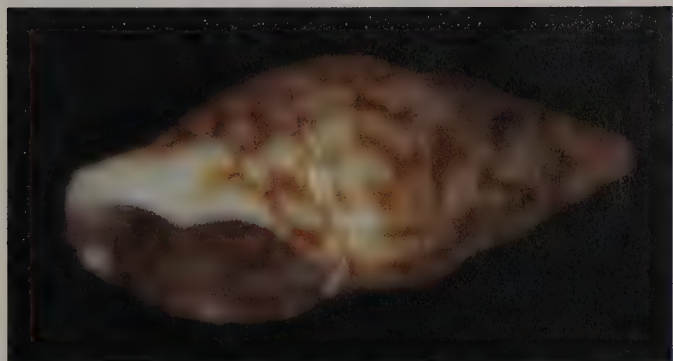
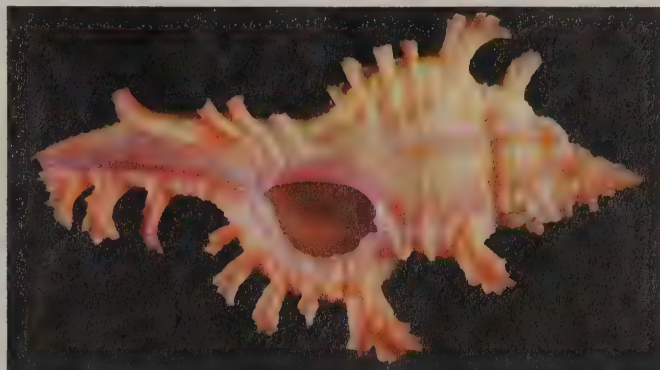


Image of *Z. pulchellum* produced with a flat bed scanner. This shell pushes past the capabilities of the scanner resulting in a blurred image.



The final photograph. All the stops were pulled out for this one: even/directional illumination, adequate light levels, high f stop, filters, compositing, and digital adjustment to color balance, hue, saturation, and sharpness.

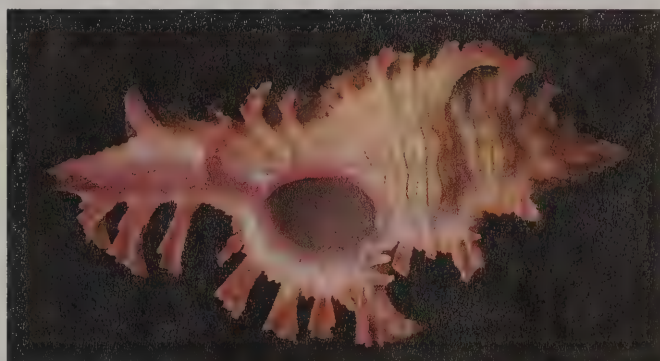


Image produced with a flat bed scanner. Note how the spire is darker than the rest of the shell. This occurs when a part of the shell is elevated off the scanner bed.

Close, But Not Quite Right:

We all take photos whose image sharpness, color rendition and lighting are close, but not quite right. With digital imaging, **minor** changes of these variables can be remedied to turn a sow's ear into a silk purse. Well, maybe not a silk purse, but possibly polyester. You must convert your images into digital format and use the power of the image processor to correct these difficulties. Note: these corrections should be used judiciously. The better the starting photo, the more effective the corrections.

Color Balance: Even with filters and different light sources, your photo may not accurately reflect shell colors. Color balance lets you adjust levels of red, blue, cyan, magenta and yellow. With these options you can tweak photo colors to match the shell.

Saturation: In simple terms it globally adjusts intensity or brightness of colors to match the shell. Saturation can also be adjusted for the specific colors mentioned above.

Contrast: Adjust the range of brightness so that black is black and white is white. Be careful! It is easy to increase the contrast until the lighter parts of the image become glaring white with no detail.

Levels: Levels are linked to contrast and, actually, the inverse of contrast. Your photo may not fill the range from black to white. You can adjust levels so you maximize the range from black to white in your photo.

Sharpness: Assuming your image is in focus, there is detail which is not readily visible to the unaided eye. With digital imaging you can enhance this detail to make it visible. Sharpness is a variant of both contrast and brightness; adjustments to the contrast and brightness on a pixel level enhance subtle differences in these components to bring

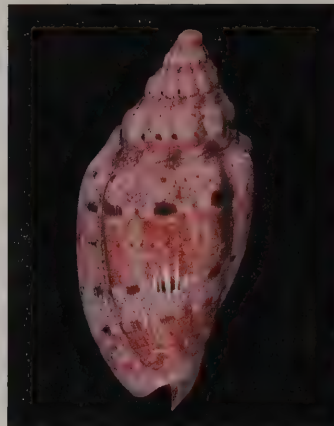
(Continued on page 31)

CARIBBEAN VOLUTIDAE

by Kevan and Linda Sunderland



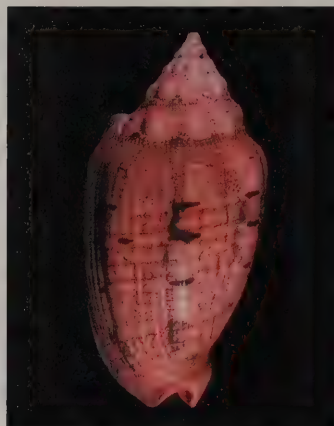
Voluta morrisoni harasewychi (Petuch, 1987). 56mm. 20-120', by lobster boats on the offshore banks of Honduras.



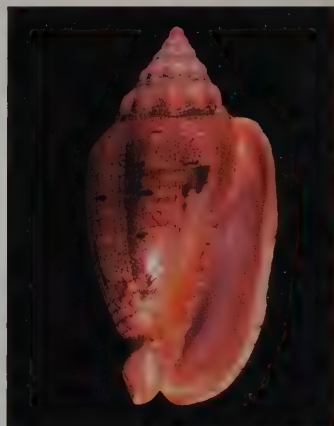
Voluta morrisoni (Petuch, 1980). 52mm. 20-120', by lobster boats on the offshore banks of Honduras.



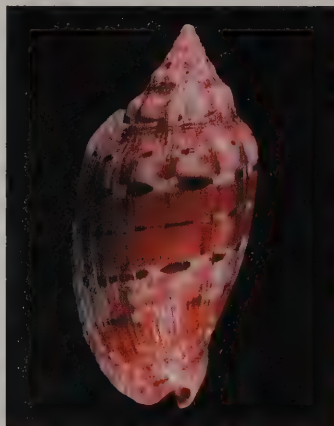
Voluta polypleura sunderlandi Petuch, 1987. 54mm. Taken by diver in 40', near Sandy Key, Utila, Honduras.



Voluta polypleura Crosse, 1876. 93mm. 30 - 200', on muddy sand by shrimp boats, offshore Honduras / Nicaragua.



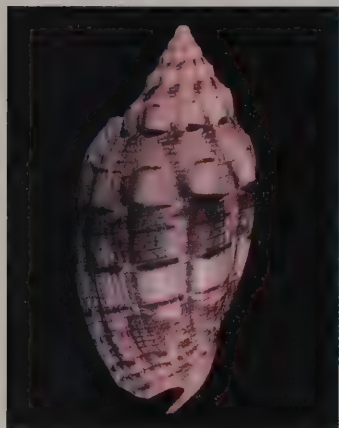
Voluta kotorai (Petuch, 1981). 81mm. 20-120', by lobster boats on the offshore banks of Nicaragua.



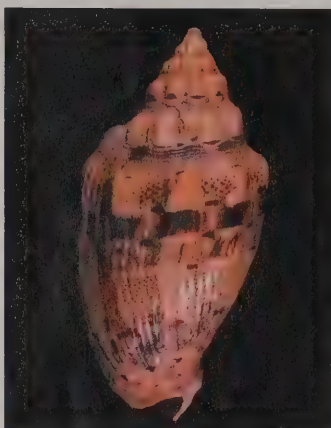
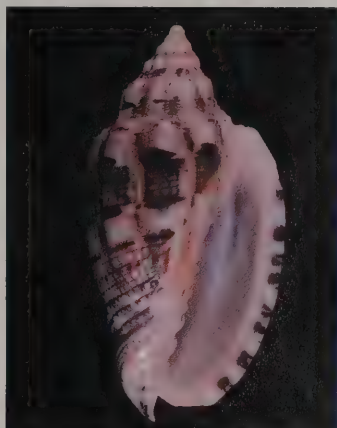
Voluta polypleura hilli (Petuch, 1987). 94mm. 20-120', by lobster boats on the offshore banks of Honduras / Nicaragua.



The intent of this feature is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



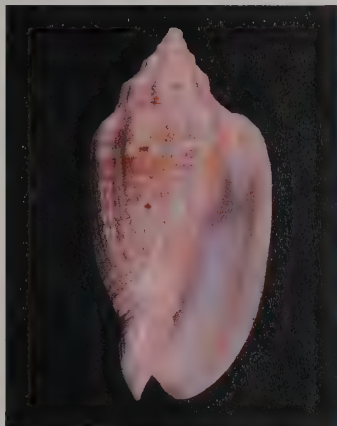
Voluta polypleura retimirabilis (Petuch, 1981). 89mm. Exact location unknown, believed to be off Caratasca Cays, Honduras.



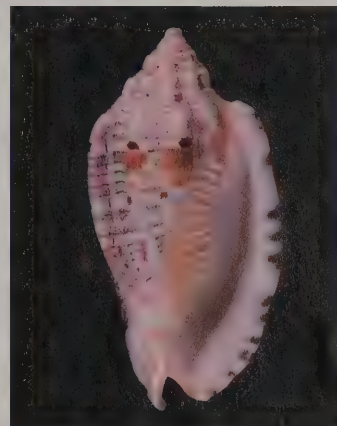
Voluta polypleura Crosse, 1876. 90mm. 30 - 200', on muddy sand by shrimp boats, offshore Honduras / Nicaragua.



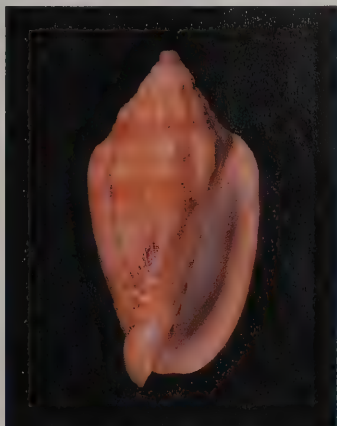
Voluta polypleura Crosse, 1876. 81mm. 20-120', by lobster boat on the offshore banks of Nicaragua.



Voluta polypleura retimirabilis (Petuch, 1981). 76mm. Exact location unknown, believed to be off Caratasca Cays, Honduras.



Voluta polypleura Crosse, 1876. 45mm. 30 - 200', on muddy sand, taken by shrimp boats, offshore Honduras / Nicaragua.



Voluta polypleura Crosse, 1876. 54mm. 30 - 200', on muddy sand, by shrimp boats, offshore Honduras / Nicaragua.



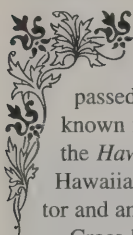
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Ellis Cross

Sheller, diver and editor extraordinaire Ellis Cross passed away Monday May 8 in Port Angeles WA. As well known for his diving and diving writing as for his editorship of the *Hawaiian Shell News*, Cross was a longtime member of the Hawaiian Malacological Society, an avid deepwater shell collector and an advocate for shell collecting.

Cross became HSN editor (as well as President of HMS) after the resignation of Karl Greene in late 1961. His editorship through the next 15 years built the worldwide reputation of HSN, focussing the international shelling spotlight on Hawaii as its spiritual center. Co-editing with Cliff Weaver from late 1962 until early 1964, he again became HMS president in 1965 and 1966, resuming his editor's mantle in 1967. He continued as editor until Stu Lillico took over in 1975.

(Bay Scallop Season, continued from page 6)

On September 26th, I took my boat out to a spot called Dog Ballard Reef, roughly nine miles out from the St. Marks boat ramp. Basically an artificial reef created around a natural reef area, it is in about 25 feet of water. Previous attempts to dive here had been doomed because of bad visibility and once because of a faulty regulator, but this day I was determined to see what was there.

I pulled myself down the anchor line and soon was in a veritable undersea garden. Almost every inch of space on the artificial reef, created by dropping a huge number of concrete culverts into the water just a few years ago, was already covered with gorgeous soft corals and brightly colored sponges, as well as blue tunicates, seaweeds and a variety of other sea life. At some points I was simply surrounded by thousands of small silver fish; at other times, Atlantic Spadefish swam up to take a look at me or I would come upon a big, curious grouper. This place was not like any coral reef I had ever dove, but it was full of life and simply magical. I wished I had brought my underwater camera with me.

I swam around and found a few dark-colored *Strombus alatus* (Florida Fighting Conch) out in the open sandy areas, a few *Fasciolaria tulipa* buried in the sand, and several *Chicoreus florifer dilectus* (Lace Murex). I even found a foot-long horse conch chowing down on one of the murexes. I also found one *Hexaplex fulvescens* (Giant Atlantic Murex) sitting atop a bare spot of concrete. This was the distinctive "wreck" form which is smaller and has more (but shorter) spines and a longer siphonal canal. I decided to keep the *H. fulvescens* and the largest Lace Murex.

As I swam around in wonder, out of the corner of my eye I saw what at first I thought might have been a *Nodipecten nodosus fragosus* (Lion's Paw), but knew that they were not found here in such shallow water. I could see that the bottom valve was buried in the sand, and as I got closer, the top valve slammed shut, effectively making the shell invisible since the top was covered with sand and the usual growth of algae and such. What could this be, I wondered. As I lifted it out of the sand, I saw that it wasn't as large as I had at first thought (remember that everything looks about one-third larger under water), and after careful inspection decided that this was actually an *Argopecten irradians concentricus*, but a big one, and much heavier than any of the shallow water shells we had found. I looked around and found several more, but by this point I was running short on air. I cursed myself for not renting a second tank and headed for the boat.

After cleaning up these "reef" scallops, I saw that they are clearly quite different from the grass flats forms. They are much heavier, and all measured about three inches or more across. The tops had black or dark gray ribs with white between them. Oddly enough, near the umbonal area several had a dusty rose color with some white spots that almost looked painted on. Another specimen had a dusky gold color. All had almost pure white bottom valves.

Before it got too cold, I made several more trips to Dog Ballard. On

Even then Cross remained Editor Emeritus and a guiding light of the world-loved HSN until paper production ceased in 1997.

Cross's company furnished diving services to oil refineries, and he was an expert in the construction, maintenance, and repair of underwater pipelines. He wrote for Skin Diver Magazine, contributing a column, "Technifacts," for that publication. His expertise brought him many awards, including the 1973 NOGI Award from the Underwater Society of America, with such diving greats as Valerie Taylor, Eugenie Clark and Jacques Cousteau. In 1990 he was inducted into the Diving Equipment Manufacturers' Hall of Fame.

In 1986, Cross retired to Port Angeles, Washington. There he became an avid historian of the area's Indian affairs. Although frequently ill, he remained as active as possible in shelling and diving. Shelling has lost one of its greats! —LS and WT

these dives I was even more fortunate because I encountered several giant jewfish—monster members of the grouper family, one of which had to weigh in at over 500 pounds. I also saw a lavender frogfish (which looks like a sponge), several batfish, some small *Spondylus americanus* which were just getting a toehold on the reef, and a number of fish that I still have not been able to identify. I even found more of the big reef *A. irradians*, including a huge orange specimen that I decided I had to have (please don't report me to the scallop police).

It was truly a remarkable summer and one that I will never forget. My shell collection is bursting with *Argopecten irradians*, some flamboyantly marked, others somberly plain, but each one of them is much more than I ever had expected from a species that I had previously assumed to be drab and really not worth collecting. What's more, the many specimens I sent overseas have brought a number of interesting shells in exchange.

As a sidenote, I wrote a brief article on my experiences for the Jacksonville Shell Club newsletter. Not long after the article appeared, I got an e-mail from Dan C. Marelli, Ph.D., who is an Invertebrate Biologist with the Molluscan Fisheries Project at the Florida Marine Research Institute.

Dan wrote: "One of the things you might not be aware of is that myself and others wrote a paper a few years ago that makes the name *Argopecten irradians concentricus* unavailable for Gulf of Mexico scallops. *A. irradians* is okay to use for now. A couple of things in your article are very interesting to our scallop research group: The scallops on Dog Ballard reef sound like they might be Calico Scallops (*A. gibbus*). A quick look at a few shells would confirm it. [Author's note: They are not.] We might be interested in accompanying you on a trip back to Dog Ballard reef. It has always been my experience that 'amateur' malacologists are keen observers and valuable recorders of pertinent data."

In a later correspondence: "One of the things I have been interested in is the morphology of the Gulf *A. irradians*. Somewhere between Steinhatchee and St. Joseph Bay there is a break between distinct peninsular and panhandle forms. You may have discovered the area where they overlap."

Dan further noted that the next available subspecific name is "*taylorae*" and that "the concept of the subspecies in this genus is in flux and may change." All of this makes my interest in this particular scallop all the more keen. It will be interesting to see what the Marine Research team concludes after they see my specimens.

For most of my life I have hated summer. It's too hot, too humid. For the first time ever, I cannot wait for next summer. That in itself is even more remarkable than the unexpectedly provident Bay Scallop harvest of 1999.

Jim Miller is a communications consultant, freelance writer, photographer and sometime session guitar player who is thrilled to make his home in Tallahassee, Florida.

(Photography of Seashells, continued from page 27)

out detail. Even if your image is really out of focus you can increase its sharpness with this technique, but the end result will not be as sharp and detailed. If you are literate in computer programming you can write your own programs for sharpening images. I wrote one I use extensively in preparing images for *American Conchologist*, to sharpen images and detect, then enhance, patterns. The down side is that the program is so large and complex that it runs on a high end work station computer, not a PC or Macintosh.

Illumination: In photographs, inadequate illumination can hide details in shadows. When we discussed compositing, we described a tool for selecting a certain part of an image. Use this tool to outline the shadowed part of the image and adjust its contrast or brightness. A definite limitation to the technique is that making a specific part of the image brighter may result in the adjusted part of the image simply not fitting into the overall image. It stands out! Minimal adjustments can be made using this technique. The best remedy is to start out with optimal illumination.

Resolution:

Resolution is the ability to visualize detail, more specifically the ability to resolve, or see, two closely positioned objects. Final image resolution depends on many factors: film grain, resolving power of lenses, illumination and vibration artifacts. Achieving optimal resolution requires a combination of these three elements. You need a small enough grain size to capture detail, coupled with lenses of high resolution, and a reduction of vibration. Of course, achieving the correct combination is a trade off. High speed film requires less light allowing higher shutter speeds and higher F stops. Vibration artifacts are reduced, depth of field is increased, but grain size is large (lower resolution). Low speed film requires more light, translating into slower shutter speeds and lower F stops; it 1. increases chance of vibration artifacts, and 2. reduces depth of field, but 3. grain size also becomes smaller (higher resolution). Therefore, one has to match the equipment and film to achieve an acceptable resolution. Lots of trial and error photographs are required.

Digital Cameras:

Availability and range of digital cameras is rapidly increasing. A few years ago one couldn't begin to think of using digital cameras to get high quality shell images without a deep pocket or large research grant. This has now changed. Like computers, advanced digital camera technology has filtered down to the consumer market. These cameras can produce images capable of being printed at an image size of 8" X 10", indistinguishable from traditional 35 mm photos. These cameras also allow you to control shutter speed and F stops, and have built-in correction for tungsten and fluorescent light sources. Digital film (Smartmedia and Compact Flash) can store the same number of adequately high resolution images as a traditional role of film, but this digital film is reusable. Simply download the images onto your computer, erase the digital film and put it back into the camera. There are limitations to this. The highest resolution photograph (1600X1200 pixels, uncompressed) takes up about 8 Mb of memory (4 images on a 32 Mb digital film card).

One drawback of these cameras is that the lenses are not interchangeable like they are on a traditional 35 mm camera. You can opt for spending about \$4-6,000 to purchase a digital camera with interchangeable lenses. Usually you are stuck with a 3X zoom lens ranging from about 28 mm to 100 mm. The macro designation on these lenses simply means the ability to focus close, and not necessarily a highly

corrected lens specifically designed for macrophotography. The camera models put out by the major camera manufacturers (e.g. Nikon, Olympus) have the same high quality lenses as on their 35 mm cameras and are up to the rigorous demands of macrophotography. The resolution of digital cameras is fixed, despite the lens, and is related to the number of pixels in the CCD. A camera with 2.11 million pixels (1600 X 1200 image size) has a maximal resolving power of 800 X 600 lines or dots. Simply fill the frame with your shell to achieve maximal resolution. To increase resolution you will have to buy a camera with a larger CCD. Like computers, the resolution and features of digital cameras are constantly changing. Recently, the resolution of CCDs has increased from 2.11 to 3.3 or 4.3 megapixels.

With digital cameras you don't get a negative and a 4"X6" print from the drug store or supermarket. You have to print the images yourself. Today's digital printers can print digital images of high resolution. Print resolutions vary between 1,440X720 and 2,400X2,400 dots per inch and produce highly detailed pictures of high contrast and excellent color rendition rivaling the traditional print. In addition you can have your digital image converted into a slide by your local photo shop.

Scanning Shells:

Scanning shells is based on the same principles as digital cameras; you don't have to worry about lenses, extension tubes, or digital film. Just place your shell on the scanner platform, choose a resolution (e.g. 300 dpi) and scan. This technique produces excellent images for general collection documentation. Drawbacks? You can't adjust the intensity, angle, or color temperature (e.g. the degree of red) of the light source. If part of a shell is elevated from the scanner bed it will receive less illumination and appear darker. Resolution of scanned shells is also lower than with either traditional 35mm or digital photography. However, this technique is great for flattish bivalves.

Getting Your Image Ready for Publication:

Let us assume we have a photo of excellent resolution, focus, lighting, contrast etc. How do we get this picture into printing format? All major printing houses convert images into digital format for printing. If your image is already digital, no conversion is necessary. If your image is in traditional format—slide, negative or print—scanning is necessary. First determine the final size of the scanned image. For this you need to know how big the final photo will appear in print. Printing presses require images with resolution of 300 pixels per inch. If your photo is to appear at 4" X 5" then scan for a final image size of 1200 X 1500 (don't worry about the DPI or LPI setting) or take the digital photo at the size closest to 1200 X 1500. After you have scanned your image or obtained a digital camera photo, load it into your graphics program (e.g. Paint Shop Pro, Adobe PhotoShop). Set your final image size in inches (e.g. 4" X 5") and the resolution for 300 pixels per inch (also dots per inch or lines per inch). Now the photo has been formatted for printing. You cannot take a picture of 640 X 480 pixels and enlarge it to 1200X1500! It will look as if it is composed of blurred Lego blocks representing the pixels of the image. Start with a picture as large as possible and of high quality. During printing you are compressing the information in the large size original into the final print size.

Now we can print our own pictures at home. There are many excellent printers capable of producing excellent printed images, indistinguishable from a traditional photograph (HP Desk Jets — 2,400X1200 and Epsom Stylus — 1440 X 720).



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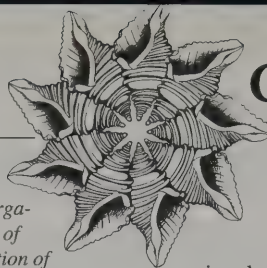


AMERICAN CONCHOLOGIST

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amconch@mindspring.com

VOL. 28, NO. 3

SEPTEMBER 2000



VOL. 28 No. 3 SEPTEMBER 2000

In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: *Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.*

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MEMBERSHIPS are for the calendar year, January-December, late memberships retroactive to January. **2000 DUES:** (USA, Canada, Mexico) \$20.00; **Postal Surcharge:** \$10.00 for other Western Hemisphere nations; \$12.00 for Europe; \$15.00 for Asia, Africa and the Pacific Rim. Please pay in U. S. dollars, or with a check on a U.S. bank with Transit Enrouting and Account Numbers printed at the bottom, or with money order; make checks payable to CONCHOLOGISTS OF AMERICA. **NEW MEMBERS AND ADDRESS CHANGES** go to Doris Underwood, **MEMBERSHIP DIRECTOR**. **RENEWALS** go to **TREASURER**, Phil Deitz. **BACK ISSUES** are available from **PROPERTIES DIRECTOR** Hank Foglino, 4 Trent Court, Smithtown, NY 11787-1266. Prior to 1985 \$3.00 each; 1985 to current \$5.00 each.

PRESIDENT'S MESSAGE

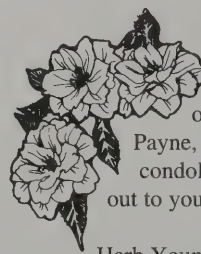
Those of you who missed the Houston Convention in June missed a good time. The auction hit an all time high for amount bid, and the silent auctions were many and good. The programs were excellent and covered a wide range of subjects. I would like to congratulate the Texas Convention committee for another great Texas Convention. Even though we were in a different location, many of the committee had been part of the Corpus Christi Convention.

Next year, we are scheduled for Cape Canaveral. I understand that they have many exciting events planned! Would a shuttle launch be a possibility? I know for a fact that we will have a special banquet speaker and many more goodies. Keep your eyes open for the news as it comes out in the *American Conchologist*. Mark your calendars now for "2001 Shell Odyssey" scheduled for July 7 - 11 at the Radisson Resort at Cape Canaveral.

I would like to say thank you to the newly elected members of the Board who agreed to serve for the next year. I also would like to thank the many appointed members of the Board who agreed to stay to assist the new board members as we begin a year of helping COA grow and become a greater force in the shelling world. Please give the board your support and help.

If anyone has a wish to host a convention in the future, please contact a member of the board and let us know you are interested.

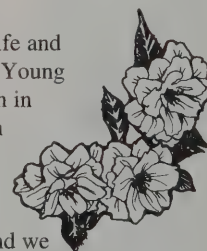
Betty Lipe



Flowers to....

Travis Payne and his mother Sally Payne, on the loss of their father and husband, Roy Payne, on July 29. Sally and Travis, our sincere condolences and our support in this sad time go out to you both.

Herb Young on the loss of his wife and COA's longtime friend Wilma "Butch" Young while many of us were at the convention in Houston. Herb, a former COA officer in several capacities and member since the early days of the organization, has been very ill with cancer and heart problems as well. Herb, we'll miss her terribly, and we are thinking of you every day!



COVER: Ross Gundersen, photo editor for *American Conchologist*, aficionado of the Jamaican molluscan fauna and photographer extraordinaire, brings the first-ever photos of nudibranchs to the cover of *American Conchologist*. This veritable potpourri of colorful sea slugs hails from St. Ann's Bay, Jamaica. Ross tells us the taxonomy of these slugs is not yet complete.

2001 SHELL ODYSSEY

by Bobbi Cordy, Co-Chairman of COA's Millennium Convention

The resort's lush, tropical courtyards will remind you of the Caribbean as you step into the Radisson Resort at the Port—Port Canaveral on the Space Coast of Florida that is!

Plans are well underway by the Astronaut Trail Shell Club of the Space Coast for the 2001 Conchologists of America Convention. And yes, we have hopes that a launch will be scheduled for that week.

You're going to love the Radisson Resort at the Port—it has newly built suites which include a master bedroom with king size bed and hot tub, and a pull-out queen size sofa in the living room—and there's a mini kitchen (microwave and refrigerator) to make your stay more comfortable and convenient. The suites rent for \$130 per night. There are also over 200 luxury rooms with two double beds with coffee makers, ceiling fans, hair dryers, remote controlled tv, private voice mail messaging and beautifully appointed decor for \$105 per night for 2-4 people.

Convention Highlights:

1. A Caribbean theme for the Welcome Party along with entertainment
2. Special displays by sea-related and space-related local agencies.
3. Workshops for the beginner and the advanced shell collector.
4. A mini Shell Show—single specimens only (easy for everyone to take on the plane). Interesting categories to be included.
5. Field Trips Galore:
 - Kennedy Space Center with a bus to pick you up at the Radisson.
 - Harbor Branch Oceanographic Institute also by bus (about an hour away).
 - Nightly turtle watches on the beach. Sign up for the night you want to go...limited to 20-25 people per evening.

At the Radisson there is plenty of free parking and free transportation to the beach and the port. Bourse set up will be easy with many doors to enter and you can pull your van or trailer right up to the door. The Convention Center is in a separate building from the hotel with a covered breezeway. This means no one except COA participants will be in the Convention Center.

The club is NOW accepting donations for door prizes, raffle items, silent auction and oral auction. Please contact or send to the following:

Oral Auction: John Baker, 8745 So. Tropical Trail, Merritt Island FL 32953 (321)773-5058

Silent Auction: Jim Cordy, 385 Needle Blvd., Merritt Island FL 32953 (321) 452-5736

Door prizes and raffle items contact: cordy@yourlink.net (321) 452-5736 or underwood@yourlink.net (321) 724-2449.

The Astronaut Trail Shell Club is noted for its great hospitality and especially for having a good time! Come spend COA's Millennium Convention with us at the Radisson!

Late breaking news: The guest speaker for the 2001 Shell Odyssey Convention banquet will be: S. Peter Dance from London, formerly with the British Museum, the Manchester Museum and the National Museum of Wales. His books include *Shell Collecting: An Illustrated History*; *The Collector's Encyclopedia of Shells* and *The Art of Natural History*. He co-authored *Compendium of Seashells* with Dr. R. Tucker Abbott.

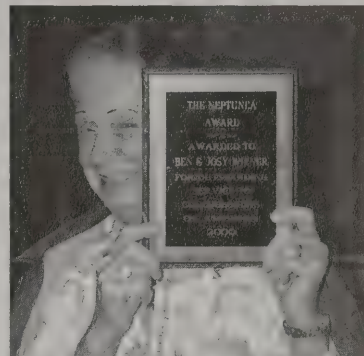
The Neptunea Award

by Linda Brunner

Long cognizant of the need to recognize outstanding and distinguished service to Conchologists of America, its scientific interests and the science of malacology as it applies to conchologists, the Board, at its midyear meeting, created The Neptunea Award.

The first recipients of this award were Debbie Wills, Ross Gunderson, and Ben (posthumously) and Josy Weiner. These plaques were presented during the annual meeting at the convention in Houston, Texas. Debbie has given generously to COA by acting as our web master for ConchNet. This has involved many hours formatting every item on the web site. She also served as the Lambis liaison for a year. Ross, aside from writing articles for *American Conchologist* and crafting a beautiful harp for the oral auction, is the Photographic Editor for *American Conchologist*. This means that he scans every picture that appears in the magazine. Ben and Josy have, for as long as I can remember, sold raffle tickets at the convention and, when possible, presold them. They have tirelessly promoted our organization. Everything these recipients have done has been done on a voluntary basis. It was an honor to present these awards to these deserving advocates.

There are many other scientists and members who also deserve recognition. To receive this award one must have given service to the organization or service to the scientific interests of COA or service to the science of malacology as it applies to conchologists. This is your opportunity to nominate someone you feel meets the criteria of The Neptunea Award. Nominations must be submitted to a board member by January 1, 2001. No more than three will be awarded. Please take time to nominate someone who has enriched your study or collecting of shells.



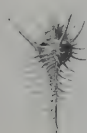
Josy Weiner, one of the first winners of the Neptunea Award for Outstanding Service to COA. She and her late husband Ben ran the COA raffle together for many years. It was well-deserved, Josy! Photo by Faye Mucha

BOARDTALK.....

From DORIS UNDERWOOD, COA Membership Director: IMPORTANT! Enclosed with this issue of the *American Conchologist* is the DUES RENEWAL NOTICE FOR 2001.

Please check the label on the magazine envelope. The date above your name indicates for what year your dues are currently paid. A number of members have already paid their dues for 2001 — one of them may be you!

Renewal dues are to be sent to Phil Dietz, Treasurer, at PO Box 242, Cape May, NJ 08204-0242. Applications for **new members and any changes** (ie, address, name) should be sent to Doris Underwood, Membership Director, at 698 Sheridan Woods Drive, West Melbourne, FL 32904-3302. E-mail: dunderwood1@cfl.rr.com. THANK YOU.



A REMARKABLE CATCH

by Charlotte Lloyd

On April 24th of this year my son Brian was surf fishing for whiting at Katherine Hanna State Park in Atlantic Beach, Florida. He felt something pulling on his line and reeled in a discarded fishing rig entangled with algae, dead sea whips, marsh grass, a large parchment worm, sponges, and an empty whelk egg case. This biomass was teeming with a zillion (his description) hermit crabs in miniature shells. Recognizing several species of epitoniums he put the entanglement in his bucket, added seawater, and went home to call me and tell me what he had for me. I was on my way to give a shell program to senior citizens and it was several hours before I could pick up the bucket; consequently the hermit crabs expired. First glance told me it would be worthwhile to examine the shells more closely.



Brian's catch

Once home I photographed the 10 by 12 inch "catch" and removed the shells from the entanglement. Then came the task of removing the hermit bodies from the shells. I found the "panning for gold" method to be the most successful. With water running into the bowl filled with shells, most of the hermit crab bodies, less dense than the shells, washed out and over the bowl's rim.

I identified the hermit crabs as *Pagurus longicarpus* Say, 1817, a small, common and plentiful crab along our coast. They insert their well-developed, soft and somewhat coiled abdomens into dead mollusk shells that they carry around on their back as portable protection.

I noticed large numbers of *Nassarius acutus* (Say, 1822), the Sharp-knobbed Nassa, so thought it would be interesting to compare the numbers of different species and to come up with a count. *Nassarius acutus* (photo on left) is a small 8-12 mm species that has a glossy, sturdy structure with strong pointed beads on the whorls. The beads occasionally have a narrow brown spiral line connecting them. Dr. Harry G. Lee was excited to hear about the catch and offered to identify all of the shells. (See the list with identification and count numbers at the end of this article.) At final count I recorded an amazing 3,952 shells, with



The unsorted gleanings from Brian's catch

2,088 being *Nassarius acutus* for 53% of the total. The 1,864 other shells were distributed among 59 different species.

Why so many *Nassarius acutus*? The family Nassariidae, the mud snails, are shallow water, usually intertidal dwellers. They occur in large colonies and are scavengers. Several months ago I witnessed a closely related *Nassarius* species of the Indo-Pacific, in the surf at Nuku Hiva Island in the Marquesas. This mollusk was very active in the surf zone. Each wave would lift the tiny snail several feet off of the bottom whereupon the creature would use its mantle to maneuver/glide to the bottom to feed again. There must have been thousands in an area of about 5 square meters. I can only surmise that locally *Nassarius acutus* has the same habit and is a lot more common in our surf than I had originally thought.

The question also arises as to why so many hermit crabs were on the biomass entanglement. What are the gains of coexistence—food, protection, reproduction? We do know that some hermit crabs like the company of their peers. Any shell collector can tell of turning a rock and finding hundreds of hermits "hanging out together." The mass could also have been a "lunch wagon" rolling along the bottom onto which the hermits could hitch a ride and feed.

Some live shells were found on the mass. These included *Astyris lunata*, *Anadara ovalis*, *Anadara transversa* and *Musculus lateralis*. Also two fossils were identified, *Carditamera arata* (Conrad, 1832) and *Gemophos lymani* (M. Smith, 1936). There were quite a few single shells of bivalves in the entanglement.

One week later I called Brian to tell him he was right about the epitonium, that there were eight species identified and that the total number of shells in the catch was 3,952. His reply was, "Wow! Mom, just think how many jumped or fell off when I was reeling it in!"

See the list and number of shells on page 24.



One of the 2,088 *Nassarius acutus* in Brian's catch

1010 N. 24th Street, Jacksonville Beach, FL 32250-2883 <clloyd6888@aol.com>

The Value of Fieldwork

Constantine Mifsud from the Isle of Malta sent us the following little vignette: Most collectors have, some time or other, had a gruesome experience during shell collecting. In a recent paper published in the last issue of the *Journal of Conchology*, bulletin of the Conchological Society of Great Britain and Ireland, describing a new species of *Melanopsis* from the Golan Heights, Southern Levant, the authors Joseph Heller & Naomi Sivan conclude:

ACKNOWLEDGEMENTS

"The British Museum (Natural History) lent us the syntypes of *M. crenita*. Mrs Sarah Ehrlich kindly carried out the water analysis. Prof. K. Bandel kindly gave us the *Esperiana* shells, for comparison. While collecting *Melanopsis* for this study, an unidentified son-of-a-bitch stole my car; it was later found with a wrecked chassis, which cost me \$4000 to repair. As this little paper has 1557 words, this means \$2.569 per word. Is this the most expensive malacological paper ever to have been written?"

Surprising New Molluscan Records for Louisiana and the Northwestern Gulf of Mexico

by Emilio F. García



Vexillum pulchellum 17.1 mm



Fenimorea halidorema 22 mm.

In the June, 1999 issue of *American Conchologist* I reported eleven new molluscan records for the northwestern Gulf of Mexico. These species were obtained from dredgings done at a depth of 55-65 m on top of small banks or "pinnacles" that rise above the sticky gray mud of greater depths (see Parker & Curry, 1956)

Last May, Dr. Darryl Felder, from the University of Louisiana at Lafayette, invited me to join him and Dr. Suzanne Fredericq, decapod and algae specialists respectively, on another dredging expedition that would take us roughly from longitude 93° West, off Sabine Pass, at the Louisiana-Texas border, east to 91° West, roughly off Isles Dernieres (Last Islands), still west of the Mississippi River Delta. The pinnacles

115 Oak Crest Dr., Lafayette, LA 70503 USA



Arene venustula 8.5 mm.

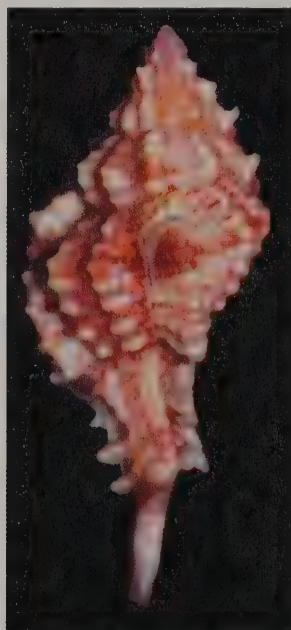


Astralium phoebia 68.2 mm. (with spines)

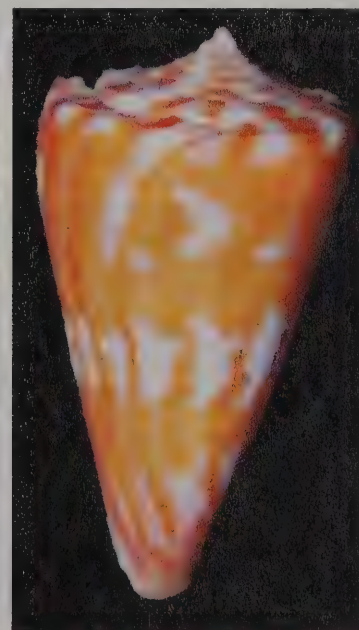
were located between latitude 27°49'N and 28°N, and rose to a depth of from 85 to 50 meters from the surface. The exception was one station where the dredging began at 155 meters and ended at 94 meters. We dredged on top of the pinnacles, whose bottom consisted of coralline rubble, except for one station where a single dredge haul came up full of sticky gray mud.

Dredging was done at ten pinnacles, with two to three 15-minute dredgings at each pinnacle. The exception was Station 10, where six dredgings were made. Although the larger species of mollusks were fairly equally distributed among stations, the richest hauls for smaller-size species were those with a combination of coralline rubble and finer sediment bottoms. The poorest was the haul from a muddy bottom. The molluscan fauna of these ten pinnacles, excluding Polyplacophora, was represented by 54 families, 41 of which were in the Class Gastropoda and 13 in Bivalvia. At least 117 species were collected.

Interestingly, the most common species, found in 6 of the stations, was *Globivenus listeroides* (Fischer-Piette and Testud, 1967), which I had reported earlier as a new record for the Gulf of Mexico (García,



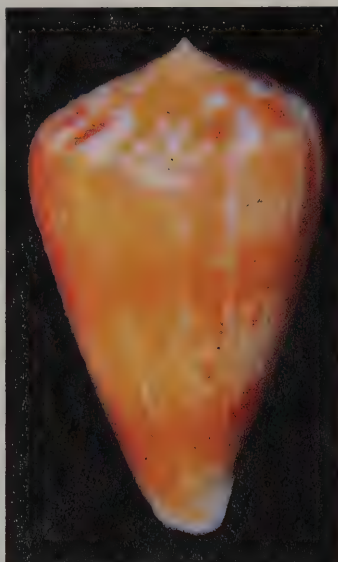
Chicoreus consuela 49.2 mm.



Conus riosi 39.8 mm.



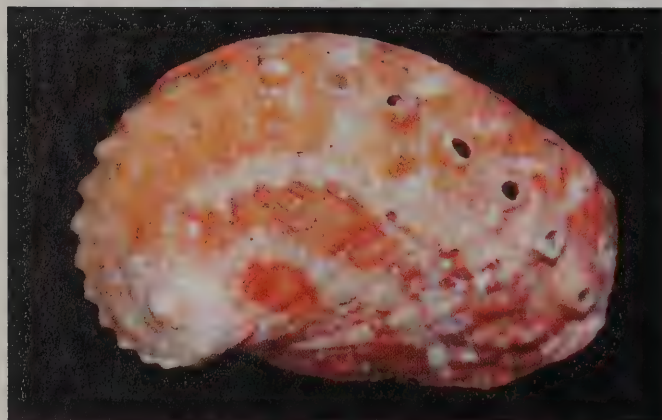
Conus mindanus f. *agassizii*
36.4 mm.



Conus ermineus 66.1 mm.
Orange form typical of
Louisiana and Texas



Conus stimpsoni 41.9 mm.
with periostracum

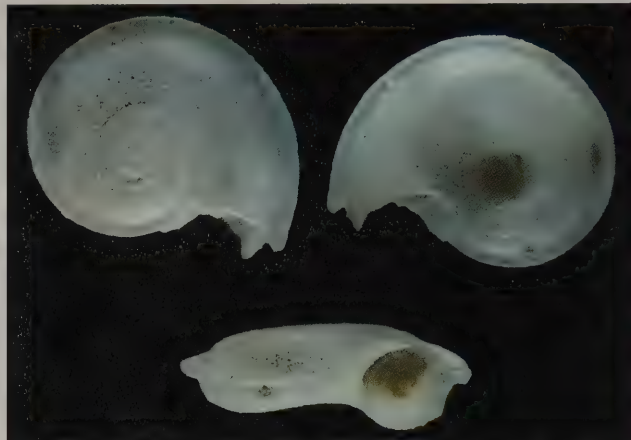


Haliotis pourtalesii 27 mm.

1999). Considering the abundance of the species, I reviewed Odé's list of marine Bivalvia for the northwestern Gulf of Mexico (1981), and came to the conclusion that he may have misidentified this species in his publication as "*Circomphalus*" *strigillinus* (Dall, 1902), a similar but distinct species (see García, 1999).

Other common species were *Acar domingensis* (Lamarck, 1819), *Botula fusca* (Gmelin, 1791), *Cerithium litteratum* (Born, 1778), *Mitra nodulosa* (Gmelin, 1791) (as juveniles), *Williamia krebsii* (Mørch, 1778), and *Turbo caillietii* Fischer & Bernardi, 1857.

Although it was not surprising that 10 of the 11 species reported in the previously mentioned article could have been overlooked by earlier workers because of their small size, it was very much a surprise to find in



Vitrinorbis sp. 3 mm.

this dredging expedition so many large and showy species never before recorded in the northwestern Gulf.

The following are 23 new records for the northwestern Gulf of Mexico:

- Emarginula pumila* (A. Adams, 1851)
- Turbo caillietii* (Fischer and Bernardi, 1857) - Live
- Turbo castanea* Gmelin, 1791
- Astraliu phoebia* (Röding, 1798) - Live
- Arene venustula* Aguayo & Rehder, 1936 - Live
- Mesophora novem* (Usticke, 1969)
- Similophora intermedia* (C.B. Adams, 1850)
- Tenagodus modestus* (Dall, 1881)
- Petalococonchus erectus* (Dall, 1888)
- Babelomurex dalli* (Emerson, 1963)
- Bursa thomae* (d'Orbigny, 1842)
- Mitra antillensis* Dall, 1889 - One live, one dead.
- Vexillum pulchellum* (Reeve, 1844) - Live
- Conus mindanus* f. *agassizii* (Dall, 1886)
- Conus riosi* Petuch, 1986 - Live-collected
- Conus stimpsoni* Dall, 1902 - Freshly dead
- Fenimorea halidorema* Schwengel, 1940 - Live
- Glyphostoma epicasta* Bartsch, 1934
- Turbonilla pupoides* (d'Orbigny, 1842)
- Peristichia agria* Dall, 1889
- Pecten chazaliei* Dautzenberg, 1900 - Live
- Opalia pumilio* (Mørch, 1875)
- Palliolium reticulatum* (Dall, 1886)



Turbo caillietii 35.7 mm.

(Continued on page 31)

Land Shells of The Valley of The Cross

by Moshe Erlendur Okon



An olive tree in the valley.

around the country. A donkey, camel, or horse was tied to a pole inserted into the upper grindstone and this stone was turned over the lower grindstone, crushing the olives into pulp and allowing the oil to seep into ducts carved in the stone. Today Arab women come to col-

P.O. Box 7803, 91077 Jerusalem, Israel. Email: <erlend@netvision.net.il>



An old olive press



An illustration (c. 1725) of the Monastery of the Cross, "Monasterium S(ancta) Crucis"

In the center of West Jerusalem, between the Israel Museum and the old neighborhood of Rehavia, there lies the Valley of The Cross. Now owned by the Greek Orthodox church, this beautiful piece of land has been spared the rapid development and massive building so common in Jerusalem today. Large boulders, olive, oak, carob and other trees and an array of wildlife (plants, birds, and animals) can be encountered there.

In one hidden corner there is an old olive oil press the likes of which are still to be found in Arab villages



The Monastery of the Cross today with the Israel Museum in the background.

lect the thousands of olives, but take them elsewhere for producing the oil.

In the center of the valley lies the Monastery of The Cross. Built of hewn limestone sometime between the third and the fifth century, the Monastery is said to lie on the spot from which the tree used for the crucifixion of Christ was taken. Many of the olive trees on the monastery's ground are indeed ancient, but none are even close to 2000 years old. The monastery has been rebuilt and repaired many times, and has changed occupants and style in accordance with the history of the city (Byzantines, Persians, Muslims, Christians of different sects).

Visitors are usually welcome to visit the fortress-like monastery and its church, and for a small fee can walk about designated areas in the enormous building, including the church, a small museum and a vast dining room with a huge, long stone table. A few Greek Orthodox monks now occupy the monastery and will happily repeat its story and history to those who wish to hear it. For those interested in shelling, the monastery's grounds offer the possibility of finding several endemic land shells.



Levantina hierosolyma (Mousson, 1854) on limestone in the valley.



A night pilgrim on its way to the monastery: *Eobania vermiculata* (Müller, 1774)



Upper left and center: *Helix aspersa* Müller, 1774 (40 mm.). Middle left and center: *Helix engaddensis* Bourguignat, 1852. Bottom left and center: *Eobania vermiculata* (Müller, 1774). Right column, top three specimens: *Levantina hierosolyma* (Mousson, 1854); the lowest of the three is juvenile; lower two specimens: *Buliminus labrosus* (Olivier, 1804) Photo by Dan Karmeli

One of the most common empty shells scattered around the valley is *Levanthina hierosolyma* (Mousson, 1854). The adult shells are three to four centimeters in diameter, light tan, with an umbilicus partly hidden by the columella. The species has five darker interrupted spiral bands which quickly fade away when the empty shells are exposed to the strong sun.

Finding live specimens of this snail can be quite difficult, as they tend to hide in deep cracks in the boulders, sometimes in large clusters. They come out on humid or wet nights to feed on the epilithic lichen *Caloplaca* which grows on the limestone rocks. Freshly devoured specimens can be found in discards from moles' holes. Young specimens have a different shape which, when viewed from the side, looks much more angular.

Another very common snail in the valley is *Helix engaddensis* Bourguignat, 1852. This light brown snail is also quite large—up to four centimeters, is globular, and has a very large body whorl. There are numerous axial channels and five dark brown spiral stripes. The

TWO NEW NOVELS ABOUT SHELLS:

Frank Brogan has produced a novel in a novel format, *Fever of the Queen Conch Pearl Type*. It's an online book at 1stBooks, <http://www.1stbooks.com>, a new publishing medium which produces books in both electronic and paper form. Frank's novel about Caribbean shelling has just been released, and you may purchase the online version at \$3.95, while a paperback copy is just \$7.95. The press release for Frank's book:

"If you dive into the limpid shallows in the lee of a palm fringed island you might well encounter a mysterious queen. In her beautiful shell palace she may hoard a royal treasure. *Fever of the Queen Conch Pearl Type* is the story of an enigmatic young man who becomes enamored of the queen and covetous of the rare conch pearl she can bestow. His tortuous quest to profit richly from the queen's bounty enmeshes an attractive woman and her concerned parents. An ardent rival suitor and an assemblage of colorful island denizens are also stricken with the contagious pearl fever. You too may succumb. It is difficult to think clearly with a fevered brain, even when options are limited. Perhaps you will question the actions of the profiteers. Maybe you will applaud them. In either case, you will be challenged to



Upper left and center: *Xeropicta vestalis* (Pfeiffer, 1841) (14mm). Lower left and center: *Monacha haifaensis* Pallary, 1939. Upper right pair: *Pene sidoniensis* (de Charpentier, 1847). Lower right pair: *Euchondrus septemdentatus* (Roth, 1839). Lower left black animal is a crustacean of the Armadillium family (order: Isopoda). Lower right black animal is a crustacean of the Porcellio family (order: Isopoda) capable of rolling up into an armored ball. Photo by Dan Karmeli

animal extends considerably from the shell when active.

The snail feeds on vegetation rot, and it can be found in shady spots under dead leaves in the winter, and hidden in the ground during the dry season (which is indeed very dry in Jerusalem). Besides the rodents, raptorial birds and the bugs, who all feed on this snail, I am told it is also edible for humans (as is the *L. hierosolyma*).

Among the other snails which can be found in the Valley of the Cross are: *Buliminus labrosus* (Olivier, 1804), *Euchondrus septemdentatus* (Roth, 1839), *Monacha haifaensis* Pallary, 1939, *Pene sidoniensis* (de Charpentier, 1847), and *Xeropicta vestalis* (Pfeiffer, 1841). For those interested in crustaceans there are two kinds of the eight plated land crabs – *Armadillium* and *Porcellio*, the latter capable of rolling itself into an armored ball as protection from predators.

Two foreign pilgrims who have come to live in the cultivated gardens of houses around the valley are *Eobania vermiculata* (Müller, 1774) and *Helix aspersa* Müller, 1774. I have not seen them in the valley itself, but have found them in gardens only one hundred yards away.

explore your reasons.

"Frank Brogan is a lawyer and a gemologist. He has traveled to many islands and has often snorkeled in waters that are home to the remarkable Queen conch. Conch pearls fascinate him. So does human behavior. The impeachment of President Clinton provided the world with an opportunity to focus on the Achilles' heels of the protagonists. The author believes that *Fever of the Queen Conch Pearl Type* may lead to similar reflections, which often reveal truths about ourselves."

Moshe Erlander Okun, of Israel and Iceland, author of the article on mariculture of abalone in Iceland in the March *American Conchologist* (p. 32, see also p. 7, this issue), has also produced a romantic novel with a shelly theme, this one a book for young adults set in Iceland. *Cypraea islandica: The Treasure on the Shore* is a story of first love, and families, and friendship, and it is also the story of a fabulous but improbable new species, a cowry found in Iceland. This "pale yellow cowry about four centimeters long" with "pretty wavy black lines across it" brings great excitement to the family of its discoverer, Konný Erlundsdóttir, called by her shell scientist father "Busykonný contrarium," because she is left handed. Already in print in Icelandic, an English edition is in the works. Watch for it.

Historical Malacology: OTTO FRANZ VON MOELLENDORFF

by Kurt Auffenberg

It now seems like eons ago, but in 1981 my father, Walter Auffenberg, asked me to join him in southeastern Luzon, Philippines to search for a long-lost species of monitor lizard. He is a curator of herpetology at the Florida Museum of Natural History with a research emphasis on Asian species. It was he who introduced me to malacology when I was but the tender age of six by bringing shells for my little collection from his frequent trips. Growing up surrounded by snakes, lizards, and turtles, I later chose to study mollusks because they didn't bite. The monitor lizard in question, *Varanus olivaceus*, was only known from three incomplete specimens, none of which had more precise locality data than "the Philippines." From one of the specimens, a skull, my father determined that this unusual monitor lizard was large (perhaps over 2 meters in length) and ate fruit and/or snails. Hence, my involvement in the project. Besides, he thought it was cool to show his budding malacologist son the Philippines. What does this have to do with Herr von Moellendorff? I'm getting to that. My father was indeed successful in rediscovering *V. olivaceus* during that summer of 1981. And I began a long-term passion for Philippine land snails. It was in pursuit of this passion that I encountered one of the great malacologists of the last 200 years, Otto Franz Von Moellendorff. As my experience grew, so did my respect for Moellendorff, a man equipped with only a quill pen and some lamp oil who, despite a relatively short life, left behind a legacy the likes of which most of us can only dream.

Moellendorff (often spelled Möllendorff) was born in Hoyerswerda, Germany (about 75 miles southeast of Berlin) on December 24, 1848. His father was well placed as the Commissioner of Agriculture and later became the President of the Natural History Society of Görlitz. Young Otto had an innate respect for and interest in all things dealing with natural history. Unfortunately, he was not able to take up this study at the University of Halle, so in 1866 he began the study of chemistry. But his love of zoology and a desire to travel never left him. So in 1870, when Dr. Blau, the General Consul at Sarajevo, Bosnia, asked Moellendorff to tutor his children, he jumped at the chance. There he excelled in teaching, he married, and in 1872, published as part of the requirements for a doctorate degree, the "Fauna of Bosnia" (mostly dealing with non-marine mollusks). Dr. Blau, realizing Moellendorff's abilities, encouraged him to pursue a career in the diplomatic corps. At that time the only opportunities were in the Far East, so in 1873, Moellendorff and his fledgling family relocated to China. Having exhibited a remarkable ability for learning foreign languages, he was given the post of Interpreter to Peking. He rose rapidly through the diplomatic ranks and took positions in Peking (now Beijing), Shanghai, and Tientsin (now Tienching). Later he served as Consulate to Canton and Hong Kong. But apparently, Moellendorff was just a little too stubborn and outspoken, and had too much understanding of local politics. He made his superiors somewhat uncomfortable. So in 1886 the diplomatic administrators thought it prudent to transfer Dr. Moellendorff to Manila. He did not publish much of his malacological work while living in China. Most of his contributions on the region's malacological fauna were published much later, after his return to Europe.

Moellendorff's research endeavors blossomed in the Philippines. The general consensus in the malacological community was that the Philippines had been collected thoroughly by Hugh Cumming, Carl

Semper and others. It was also thought that small and minute species of land snails were few and far between in that vast archipelago. Dr. Moellendorff, loving a challenge and relishing the idea of proving his colleagues wrong, proceeded to do just that. He joined forces with J. F. Quadras, a member of the Forestry Department of the Philippines. Moellendorff trained Quadras in the techniques required to collect terrestrial micro-mollusks. Quadras was a quick study and proved to be indefatigable in the field. He traveled freely throughout the country, collecting at every opportunity. The combination of Quadras' field expertise and Moellendorff's drive to learn and publish proved formidable. In addition to Moellendorff's individual work, this partnership produced many published papers and made possible Moellendorff's list of the land mollusks of the Philippines. Of the over 1,500 land snail species and subspecies known to occur in the Philippines, Moellendorff named 850 (about 57%).

Poor health forced Moellendorff to relocate to a cooler climate in the fall of 1896. He was appointed Consul for Kowno (now Kaunas), Lithuania. He stayed until 1901 when he took a position with the newly formed Frankfurt Academy of Commerce. He was charged with the instruction of consulate protocol and business and commercial geography. He became extremely active in such local societies as the Senckenbergischen Naturforschenden Gesellschaft and the Verein für naturwissenschaftliche Unterhaltung, and he co-founded a local anthropological society. He also worked diligently in the malacological collections of the Senckenberg Museum. Then in late 1902 Moellendorff was stricken with an unknown cancer. By early the next year he was bedridden and, on August 17, 1903, Moellendorff died at the age of 54.

Moellendorff's death left a great void in the malacological community. W. Kobelt poignantly expressed his grief in Moellendorff's obituary (Nachrichtsblatt der deutschen Malakozoologischen Gesellschaft, 1903:161-167, English translated version by D. F. Heynemann, Journal of Malacology, 1903, vol. 10(4):121-125) "....Gone are the many other intentions which we both thought to accomplish together. For me the hope is entirely gone, that the man eight years my junior, would one day fulfill what I myself can scarcely expect to perform."

Moellendorff's published works on the terrestrial mollusk faunas of China and the Philippines remain classic today, the information therein virtually unchanged since they were penned over one hundred years ago. One reason for this triumph over the test of time is that few malacologists have taken up the gauntlet to continue the study of the land mollusks of these regions. But it's more than that. The work done on the Philippine land snail fauna since Moellendorff's death has found no fault in his taxonomy, systematics, or biogeographic theory. Over the years I have needed to utilize his Philippine contributions time and again. His work has proven beyond reproach on virtually every occasion. I can not say the same for most of his contemporaries or any subsequent researcher of the Philippine fauna.

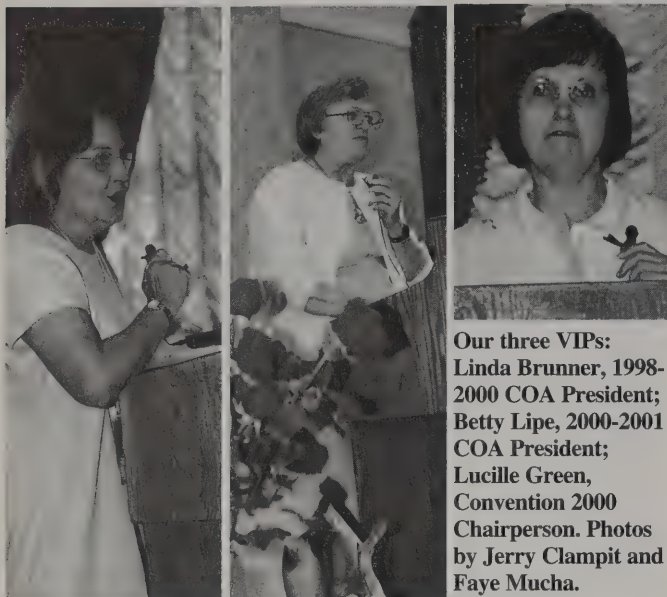
Quadras' collection (at least a large portion of it) came into the hands of the American shell dealer, Walter F. Webb. Specimens from this vast collection can be found in the cabinets of many private collectors and museums, often with original labels. Moellendorff's extensive collections were eventually transferred to the Senckenberg Museum in Frankfurt, Germany, where they still reside in safekeeping. This collection includes the primary types of approximately 1,500 species, subspecies and forms described by Moellendorff, as well as paratypes and cotypes of taxa described by his many correspondents. Its importance to the scientific community is beyond measure.

For more facts about Moellendorff, refer to Kobelt, W. 1903. Otto Franz von Moellendorff. *Journal of Malacology*, 10(4):121-125.

Selected Bibliography appears on page 24.

THE MAGIC OF COA 2000

by Don Barclay



Our three VIPs:
Linda Brunner, 1998-2000 COA President;
Betty LiPe, 2000-2001 COA President;
Lucille Green,
Convention 2000
Chairperson. Photos
by Jerry Clampit and
Faye Mucha.

I love magic. Not card tricks, not illusions...REAL magic. Magic is a lot harder to find these days than it was when I was a kid. The circus was magic. Christmas was magic. Lots of things were magic. Now that I'm a "daddy" I see magic a lot more often than in recent years, but it's mostly second-hand, in the eyes of my 20-month old daughter, Regan. I see magic in her eyes when she smells a flower, and when she stands in the rain with her hands outstretched, watching the drops splatter over her little palms. I see the same magic when she holds one of Daddy's seashells, turning it, rubbing it, admiring it. I don't know exactly what she sees in it...maybe the same things I saw when I was a child, but couldn't put into words. Yes, Regan, seashells are magic...and COA is magic, too!

The magic of last year's convention in Louisville was powerful—it drew me across the Pacific with the promise of another magical experience in Houston. I wasn't disappointed. COA 2000, A Journey to the Stars, was in fact filled with magic. If you were fortunate enough



2000-2001 COA Board of Directors: Front Row: Gary Rosenberg, Grants; Tom Grace, Vice-President; Phil Dietz, Treasurer; Hank Foglino, Properties Chairman. Back Row: Charlotte Lloyd, Trustee; Betty LiPe, President; Linda Brunner, Past President; Lynn Scheu, Editor, *American Conchologist*; Alice Monroe, Secretary; Bobbie Houchin, Historian; Doris Underwood, Membership. Not present: Karlynn Morgan, Publications; Jose Coltro, Publicity; and Donald Dan, Awards. Photo by Jerry Clampit

to have attended the convention this year, I'm sure you agree. If you weren't able to make it, you missed some fantastic programs, field trips, food, auctions, and a great dealers' bourse. You also missed a chance to visit with some of conchology and malacology's finest and brightest, to make new friends with kindred spirits, and renew old friendships with a great group of people. Probably worst of all, you missed a chance at experiencing some of that good ol' Texas hospitality, courtesy of some hard-working Texan shell club members, not to mention quite a few Honorary Texans!

Even though the COA magic had certainly been pulling me toward Houston for almost a year, my chances of attending the 2000 convention were beginning to look a bit slim. I am an air traffic controller in Pago Pago, American Samoa, and after two of our controllers returned to the U.S. while one went on maternity leave, it appeared that the "pull" of the FAA was going to override any urges I was feeling about attending a sheller's convention in the States. However, magic is magic, and after one nice controller canceled her vacation plans, and the tower manager agreed to work most of my shifts while I was gone, I made last-minute preparations to attend the convention after all. Everything went smoothly from that point on, and in a few days I was winging my way toward the rising sun with a Lyle Lovett tune bouncing around in my head, half-doing as I looked out the cockpit window of a completely packed Hawaiian Air DC-10. "That's seven," I mumbled, as another meteor streaked across the sky...



Kristen Green, daughter of Convention Chair Lucille Green, admires one of the fantastic auction offerings. Photo by Faye Mucha.

The trip from Pago Pago to Houston is a long one, over thirteen hours of flight time plus a few hours of layovers. I managed to make the trip a little longer by hopping from San Francisco down to Monterey for the night, but the diversion was worth it.

I had brought some live cone shells from

Samoa for Dr. J. P. Bingham at Yale and Dr. Bill Gilly at Stanford, and actually managed to get them to their new home at the Hopkins Marine



Spend a bundle at the auction? These three bankers will help you pay your tab: Bobbie Houchin, COA Treasurer (past), Doris Underwood, COA Membership Chairman, and Beverly Deynzer. Photo by Faye Mucha.

Laboratory in reasonably good shape. (My waiting time in Hawaii had been a lot shorter than usual, as I'd had the pleasure of visiting with the Customs and Wildlife folks for almost an hour regarding the live cones before I was allowed to go catch my next flight.) Dr. Gilly hosted me for the night, and gave me a midnight tour of the lab, along with a crash course in *Conus californicus* behavior and anatomy. I learned a lot during the short visit, and would have enjoyed staying longer, but in a few hours I was back on an airplane, working my way toward Houston. I left behind Ross Canonicus (remember "Cone Wars?") and several of his *Conus* friends from my aquarium, giving them an opportunity to make their own contributions to science.



The Howdy Crew: some of Houston's Convention Committee, giving us all a Texas-style "Whelk-um" at the Welcome Party. From left, Tina Petway, Cathy Betley, Darwin Alder, Nancy Barziza, Angela Doucette, Dave Barziza. Photo by Faye Mucha

Houston, finally. I felt like I was home, since I had lived in Houston for the five years before I took the job in American Samoa. I had lots of friends and relatives to visit, errands to run, and shopping to do, and before I knew it, June 22, 2000, was upon me. By virtue of poor planning, I managed to miss the first day of the convention activities, again. Anticipation had limited my sleep the night before, and I was at the Wyndham Greenspoint Hotel to greet the early-risers on Thursday morning. Sure enough, magic was in the air (along with a little smoke from bacon frying), and I knew for sure that COA 2000 was going to be as much fun as my first COA convention had been in 1999.

I hated that I had missed the trip down to the Brazosport Museum of Natural Science the day before, but at least I'd had the opportunity to spend the day at that museum during my last visit to Texas. There are some other great displays in this museum, but this is really a SHELL COLLECTORS' museum! The walls are mostly display cases of Gulf of Mexico shells, and you might be surprised by what has been found off of this coast. I certainly was. There are some other cases built into the walls that have non-local shells in them, too, including an impressive display of *Nautilus* that must include just about every species and form in existence. Once you've made your circuit of the room, you're not finished looking at shells in this museum. There are glass-topped drawers below all of the freestanding display cases, and



Two of Houston's mainstays: Wanda Coker, Silent Auction Co-Chair and Lucy Clampit, Bourse Chairman. What a job you two did! Thanks from all of us! Photo by Dave Green

they house thousands more shells. When you visit, plan on spending the day. This museum is fortunate to have a great group of local volunteers always willing to help out, most of them members of the Seashell Searchers of Brazoria County. This same group provided lunch for the field trippers, and everyone rated the food as highly as the museum!

In fact, the Houston group did a great job setting up all of the field

trips. Quite a few convention attendees enjoyed diversions at the beach, and many visited the Houston Museum of Natural Science. I visited this museum for the first time about thirty years ago, and it's entirely possible I would neither live in Pago Pago nor collect shells if it hadn't been for that visit. I was seven years old and I already owned a few shells, probably ten or twelve, including a *Conus furvus* (which

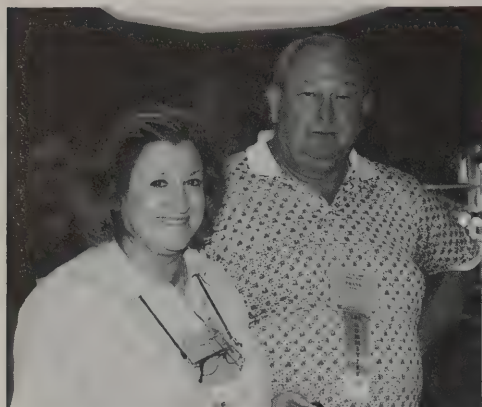
I still have). I was shocked by all the different shells on display, but most memorable was the variety of cone shell species and the fact that many of them were BIG. In my mind, as I thumbed through my trusty copy of Abbott's Golden Guide to Seashells of the World, all of the cones were the size of my little *Conus furvus*, about one inch. After seeing the fantastic display of cones in this museum, I thought, "Someday I'll collect cones." And so I do. One other mystery was solved for me by my first visit. I had spent hours studying the pictures in Abbott's little book of the *Lambis* shells, but I just couldn't figure out what was the top and what was the bottom, and if it was really possible that seashells looked like that, or if I was simply misinterpreting the pictures. When I saw a real *Lambis scorpius*, it all came together for me. The shell displays in the Houston museum have changed since then, but the same magic is still there. This year's attendees saw a great display including many rare shells, plus a reef aquarium housing a live *Tridacna* clam. Two special shells on display this year were on loan to the museum from Don Pisor: a world record *Syrinx aruanus*, the largest known specimen of the largest living gastropod, and a world record *Perotrochus rumphii*, the largest specimen of the largest of the slit shells.



More of the Houston Committee! Such a lot of great workers! Seated: Frieda White, Barbara Hudson, Dennis and Mary Harris. Standing: Lucy Clampit, Lucille Green, Nancy Barziza, Harold White, Dean Harris, Jerry Clampit, Cliff Harris. Photo by Dave Green

The programs presented this year were fantastic. From the *Busycon perversum/contrarium* discussion to freshwater mussels, from red cones of the Bahamas to a slide tour of Madagascar, there was something for every shell collector. Want to go dredge off the Pacific coast of Panama? You could have learned about that, too. How about organizing your collection? Well, there will probably never be another Emilio Garcia, but you could have picked up some good tips on cataloging your shells and fabricating your own boxes, even if your collection didn't end up looking like Emilio's. If you saw the presentations and found yourself dreaming of digging through the dredge piles or diving in the clear, blue water surrounding some tropical island, don't worry: it was just more of the COA magic.

In between the presentations you had several choices. You could run down for a quick bite to eat. Or, if you happened to have a world record sized shell in your pocket, you could let Kim Hutsell measure it for you for inclusion in his *Registry of World Record Size Shells* (a lot of people apparently did). Or, you could go circle the tables at the silent auctions, which seemed like a popular option. Since this was my second COA, I had learned the "guard your auction" trick, but somehow I didn't buy as many shells in the silent auction as last year! I guess you could call the bidding "spirited," if that term could be applied to a silent auction. The silent auction room reminded me of one of those East Texas fire ant nests, after it had been kicked a couple of times. There were some great items in the silent auction again this year, including some uncommon miters and quite a few fossil shells,



Tina Petway, Chair of the beautiful banquet 2000, and Frank Petway, Galveston Field Trip Chairperson. Photo by Dave Green

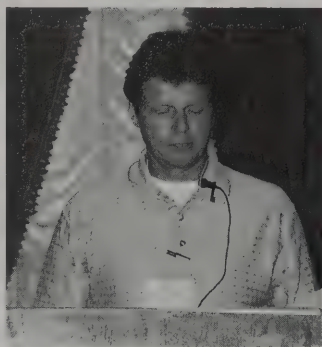


Mary Lou and Jackie Reid answer questions after their Banquet Program, "The Underwater World of Jackie Reid." Photo by Jerry Clampit

those specimens! The crowd was rushing around the tables, taking notes on the lot numbers, flipping through Rice's Prices, and whispering to their friends. "*Cypraea guttata surinensis*...gee, that's a nice one. Did you see the big, heavy *Cypraea valentia*? That one's not going to go cheap." As the viewing time ticked away, the motion in the room became more and more animated. "Did you see the big red and white slit shell? I wonder what it's going to go for. You think \$500?" *Probably more.* "Maybe a thousand?" *Maybe, but it may even go for more than that. Maybe a couple thousand.* A few walked around feigning disinterest, but I thought I could see a little sweat on the hands gripping those bidding paddles...



Programs were first class! Here's Emilio Garcia presenting his program on "Curating an Amateur Collection," and John Wise of the Houston Museum of Natural Science speaking on DNA and the Texas State Shell. Photo by Faye Mucha



and a lot of neat shell books and magazines. Among other things, I left the silent auctions with several nice cones, a pretty red *Harpa harpa*, the last sixteen years worth of *Hawaiian Shell News*, and a smile on my face.

I guess the word "magic" is about as good as any for describing the atmosphere at the oral auction. There was a little tension and anxiety in the air, plus lots of anticipation and excitement. A really fascinating collection had been generously donated to COA for sale at the convention, the Edwin Greenhow Collection, and interest ran high because of the quality of some of

Once Jim Brunner and Dave Green called for people to be seated, things calmed down a bit. In almost-WWF style, our tag team auctioneers conducted their own magic show, and were soon squeezing the last dollars from all those wide-eyed bidders. There weren't many "steals" to be found in this auction, since there were so many knowledgeable bidders, but there were some truly fabulous shells. Many classic rarities, including *Conus*

ranonganus, *Conus pergrandis*, *Harpa costata* (three different ones!), a monster *Cypraea guttata*, and four different slit shells were up for auction, as well as a shelling trip to the Bahamas. There were also several excellent groupings of *Oliva*, *Conus*, and *Tibia*, plus some neat land and tree snails packages. When the bidding was over, the room looked a little like the floor of the New York Stock Exchange after closing. Thanks to all the generous donors, active bidders, and a dedicated auction committee, the oral auction raised over \$20,000 for COA! The most expensive shell auctioned for \$2200, and was won by a wonderful lady from the Houston area. This was the often-admired red-and-white slit shell, *Entemnotrochus adansonianus bermudensis*. I was personally thrilled to win a box containing the first 49 packs of Kaicher cards, great references that were conspicuously missing from my library. Well, magic doesn't always come cheap!



Phyl Pipher of Tekama NE poses with Linda Sunderland of Sunrise, FL in their look-alike outfits, while Bernie Pipher looks on. Photo by Faye Mucha



A happy group at the Welcome Fiesta: From left: Ed Schelling, Mary Schelling, Ruth Anne and Derry Dean Sparlin and their guest, Hiong Eng Ng, Margaret Taylor. Photo by Dave Green

The night after the oral auction, the Conch-L crowd held their annual gathering. My identical twin, Jon, also attended the meeting, though he, Gary Rosenberg, and I were forced to stop by the principal's office for a tardy slip. It was all the Saltgrass Steak House's fault! It was an enjoyable meeting, and an opportunity to meet many e-mail correspondents face-to-face. You won't find a nicer group of people anywhere, I guarantee.

Sunday brought the opening of the dealer's bourse, and some of the most powerful magic of the whole convention. So you only self-col-

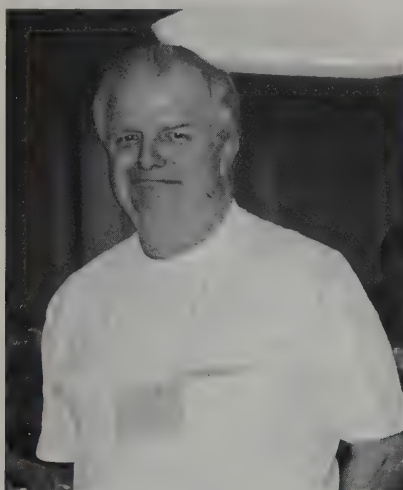


Dominic Rawlingson Plant from England, Charlotte Lloyd of Jacksonville, FL and Karlynn Morgan from Burlington NC enjoy a moment in front of Faye Mucha's camera.

lect, and wouldn't think of buying a shell? STAY AWAY FROM THE BOURSE, you'll be corrupted!!! A few dealers who attended last year's COA were noticeably absent, but there were many "new" dealers in attendance this year. There were dealers from South Africa, Israel, Chile, Brazil, New Caledonia, Australia, Vietnam, Indonesia, and lots of other countries, plus those from North America and all over Europe. Need that rare *Latiaxis* from New Caledonia? No problem. Dying for that new *Conus immelmani*? Several of these to choose from. How about a *Cypraea lisetae*? *Pleurotomaria rumphii*? *Cypraea barclayi*? No problem with these either, though some required deep pockets. There were also enough beautiful land shells and tree snails to proselytize practically any marine collector. If you were interested in shell stamps or coins, there was plenty to keep you busy. Wooden shell carvings and shell jewelry were available, and if you've always wanted to book a submarine trip to go grab those slit shells for yourself, well...you might have been able to arrange that, too!

It didn't seem like quite as many people got trampled this year at the opening of the bourse (just kidding), but it was obvious that everyone was anxious to get inside. I brought my brother-in-law, Sam

Lovell, and his son, Ross, with me for the first day of the bourse. Sam, a beginning collector, enjoyed looking at all the fantastic shells. As for Ross, he certainly enjoyed the shell shopping, even if most of his money did go for coins with shells on them. I heard, "Uncle Don, come look at this," several times during the day. I soon learned that this really meant, "Uncle Don, I already spent the last five bucks you gave me, can I have another five?" (Lucy Clampit kept him entertained after I ran out of money!) I had rushed in



Of Sea and Shore editor Tom Rice of Port Gamble, WA at the Bourse. Photo by Faye Mucha

with the rest of the crowd, and was the first to get a hand in Don Pisor's Dollar Basket. Before I could get the second hand in, there were four others digging with me, and everyone was finding lots of goodies. The *Cypraea venusta* that Don had accidentally left in the basket did get returned, but I still came out with some good shells. One of them was a beach *Cypraea rabaulensis*, with no data, but a good space filler for me anyway. I also snatched out a beautiful *Mitra isabella*, and the biggest *Latirus craticulatus* I've ever seen, a few millimeters off the world record. I ended up buying something from about half the dealers in the bourse, though I didn't come out with any of those multi-thousand dollar shells. I still had to wonder if my wife was going to "divorce first, ask questions later." Fortunately for me, she didn't. Must have been the COA magic, again.

I brought my long-suffering, "Don't you have enough shells already?" wife with me to the banquet on Monday night, and we both enjoyed it. Actually, Melissa is very understanding about my collecting, and is a particularly good sport about it, even if snorkeling for eight hours per day isn't her idea of the perfect vacation. She is good for an hour or so in the water, though, and has found some very nice shells. She just doesn't consider herself a "collector." It was a wonderful dinner, with a beautiful slide show set to music, courtesy of the



Bobbie Houchin, past COA Treasurer and new Historian, pauses with Steve Coker, Convention Treasurer, for a moment of conversation in front of the Abramsons' Bourse booth. That's Ruthie Abramson behind Bobbie. Photo by Dave Green

Reids, both accomplished underwater photographers. Following the presentation of the new COA officers, some well-deserved awards and gifts were bestowed. I didn't win the drawing for our banquet table's driftwood and seashell creation, nor did I win the one for my table at the "Howdy" dinner Thursday night. I didn't win any of the great door prizes that were given away, either, though almost everyone else did. Me, unlucky? Of course not. I got to make the Journey to the Stars, didn't I?

The next morning Melissa and I were off to visit Homer and Ann Rhode in Florida for a few days, so we weren't able to make the field trip to Galveston. If it went like the rest of the convention, it must have been great. Congratulations to those who made the convention such a success, and congratulations to all of you who were fortunate enough to enjoy it. Even if you didn't make it to Houston, I'm sure you can already feel the magic pulling you toward Port Canaveral for COA 2001. I know I feel it. See you there!

The Permit-L Listserve

Sally Shelton (Smithsonian Institution) posted this announcement on Taxacom:

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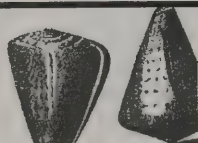
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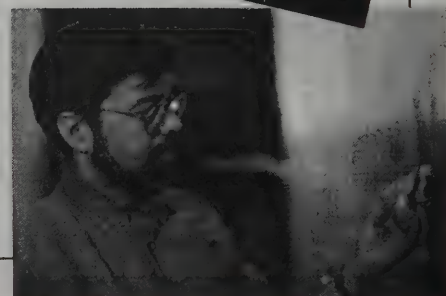
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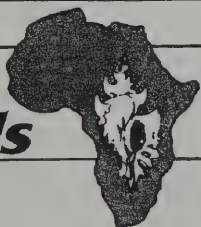
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Shell Related Web Sites

by Tom Eichhorst

Last time we strayed a bit from the typical seashell site with Glenn & Laura Burghart's chiton web site, *Chitons.com* at <http://home.inreach.com/burghart/>. This time we stray even a bit further afield from our beloved "lumps of well designed calcium," (an apt description by a member of Conch-L). Our first stop this issue is actually two closely related sites. Neither has a particularly glamorous name—*Seaslug.com* and *Mediterranean Slug Site*—but both are well worth a visit, each dedicated to opisthobranchs, especially nudibranchs or seaslugs—those often ignored mollusks that make up for their lack of a shell (in most species) with Picasso-like colors and patterns. A visit to these sites will be well worth your time. My next recommendation includes two *Cypraea*-specific sites. The first is Robert C. Dayle's *Archive Site of "The Captured Cowry"* at <http://www.geocities.com/~makuabob/> and the last is Felix Lorenz's *Cypraea Site* at <http://www.cowries.net/>. The sites form a wonderful synergistic compilation—the first site has a wealth of information in articles about cowries and the second site has the perfect image of each of those cowries. Combined, the two sites present an incredible amount of *Cypraea* information. But first, the slugs.

Seaslug.com at <http://www.seaslug.com/> is the creation of Steven J. Long of Washington State, USA. He credits others for help and assistance, but it looks like this site is the result of his labor. A monthly *Opisthobranch Newsletter* offers articles on opisthobranchs and related gastropods. Features include bibliography, current events, addresses, field notes, personal notes, reader forum—all related to opisthobranchs.

So what are opisthobranchs? Within the familiar class, **Gastropoda**, are three subclasses; **Prosobranchia** (most of the familiar families like Haliotidae, Neritidae, Cypraeidae, Conidae, etc.), **Pulmonata** (includes Melampidae, Siphonariidae, Amphibolidae, and Trimusculidae), and **Opisthobranchia** (includes the well known seashell families Pyramidellidae, Acteonidae, Bullidae, Cavoliniidae, and thousands of shell-less mollusks of some seven orders). The most commonly known Opisthobranchia are the **Nudibranchia**. Literally jewels of the sea, these rival or surpass any tropical fish, even the fanciest seashell. The problem is you pretty much need to see them alive in their natural environment. Preserved specimens are so much dark gray putty in a jar; all their beautiful colors and intricate patterns vanish when they die.

To help us appreciate the beauty of these animals, Steve has compiled over 4,500 images of opisthobranchs. Listing opisthobranchs alphabetically by genus and species, the page involves many links to other sites. You will even find a few shells here, like Acteonidae and Bullidae. A search engine for over 14,000 bibliographic citations has authors, addresses, titles, subjects, species names and illustrations. A systematic list of opisthobranchs has over 8,000 species listed and a number of links, including Bernard Picton's entire book, *Nudibranchs of the British Isles* <http://www.pictonb.freemove.co.uk/nudibranchs/>, and my favorite, Erwin Koehler's *Mediterranean Slug Site*, <http://www.medslugs.de/E/nssmain.htm>.

Mediterranean Slug Site: Erwin's site should be titled "The Worldwide Slug Site" as he has over 3,300 images of nudibranchs from around the world. An accomplished underwater photographer, he took many of these images. This is a site everyone should browse through just to get some appreciation for nudibranch beauty. Erwin lets you select an area, and either wander through thumbnail illustrations of nudibranch families of your area or selecting by species. Clicking on a thumbnail gives you images of the species in that family from your chosen area. Then click on any of these images for thumbnail illustrations of the species—each one expandable to full

screen size with a mouse click. This site is a favorite because it is built for casual browsing. You need know nothing about opisthobranchs. Just go to the Philippine page, select "Family Chromodorididae" (hard to miss this brilliant white nudibranch ringed in yellow with blue and black dorsal stripes, bright red gills, and orange antennae) and you get 27 additional Philippine species—often with numerous illustrations of each species. This is a great site, try it.

Archive Site of "The Captured Cowry": Robert C. Dayle's *Archive Site of "The Captured Cowry"* at <http://www.geocities.com/~makuabob/> contains a lot more than the title suggests. Yes, it includes that short-lived publication, *The Cowry* from December 1960 to January 1968. All of the relevant articles are here, plus the scarce illustrations—after all it was before the days of household computers, printers, scanners and such. There's also an index to the publication. Internal links enable the reader to retrieve specific data without thumbing through page after page. Click on a species name and get pertinent data about that species, or the articles that reference that species, and you can do the same for authors and illustrations. Bob has made this a very user-friendly operation.

This site also includes an index to *Cypraea*-related articles from *Hawaiian Shell News*, from 1960 to the most recent, electronic version posted on the web. Here are such treasures as the story of the first live *Cypraea aurantium* available for scientific examination by Dr. Alison Kay or a way to remove rust stains from shells. While cowry related, these articles contain a wealth of other information. An excursion to the Red Sea is found here because it found a few *Cypraea*. But the entire article is included, enabling us to follow the expedition from start to finish. There is also an index and errata sheet to E. Alison Kay's *Hawaiian Marine Shells* of 1979, an index to Strombidae articles, and an index to Cypraeacean and Triviacean literature (1971-1993) by Lindsey T. Groves. This is an invaluable site, as much for the wealth of information as for its clear, simple presentation. As you read through the articles you may find yourself wishing there were more pictures of the shells being discussed. Well, the next site has the solution.

The *Cypraea* Site of Felix Lorenz: Felix Lorenz's *Cypraea Site* at <http://www.cowries.net/> has a lot to offer, but first I want to discuss the images. Most readers are familiar with the name Felix Lorenz as co-author (with Alex Hubert) of the book, *A Guide to Worldwide Cowries*. Felix has applied the experience he gained from working on the book to this first class web site. Your first stop should be at the "Iconography of Cypraeidae," with images of some 350 species, subspecies, and *Cypraea* forms. A mouse click takes you to some of the highest quality images on the Internet. Each has a ventral and dorsal view as well as additional views of color/pattern variety. Species, subspecies, author and date, subgenus, and form are listed for each image. So if you look up the common *Cypraea vitellus* you get an image of the standard *Cypraea vitellus* as well as forms *dama* and *polynesiae*. If you look up *Cypraea arabica*, you will find *Cypraea arabica arabica*, *Cypraea arabica asiatica* (and form *gibba*), *Cypraea arabica grayana*, *Cypraea arabica immanis*, *Cypraea arabica merguina*—all represented by 12 different specimens! Each quality image is perfect for use in identification.

Much more than images recommend this site: a checklist of Cypraeidae, a checklist of Conidae, descriptions of new *Cypraea*, an extensive overview of the genus *Cribrarula*, and a series of notes and short articles on various subjects: from taxonomy to fossil *Cypraea* of Australia and the Philippines, from a Sri Lankan travelogue to a *Cypraea tigris* freaks gallery. Here you will find the article, "Parasitic Mollusca" with a number of images of well known parasitic mollusks like *Rapa* species, and a great picture of a live slit shell (*Perotrochus midas*) feeding on a sponge. Here you see *Colubraria obscura* attacking a sleeping parrotfish hundreds of times greater in size! This small buccinid is now known as the Vampire Snail. Another intriguing pre-

(Continued on bottom of next page.)

COA Awards \$9200 in Grants

By Gary Rosenberg

In 2000, the COA grants committee, consisting of Dr. Henry Chaney, Dr. G. Thomas Watters, and I, reviewed 25 grant proposals that requested a total of \$28,236 in support. The applicants included 21 graduate students, and four professional biologists. Six proposals were international: four from Argentina, one from Brazil, and one from Mexico. The committee recommended the following nine proposals for funding with a total of \$9200; this recommendation was approved at the midyear meeting of COA's board of directors. The proposal by Rebecca Rundell on succineid snails of Hawaii received the Walter Sage Award, because of its overall excellence.

• **Dr. Colin R. Beasley**, Universidade Federal do Pará, Brazil, \$1,000, "Molluscan diversity among coastal habitats of Northern Brazil." Many coastal habitats in Brazil are threatened by development and uncontrolled exploitation of natural resources. This study aims to determine species richness and abundance on the northeastern coast of the state of Pará. The information may be used to select areas for protection and will contribute to the evaluation of biodiversity in Brazil as a whole.

• **Gregory P. Dietl**, North Carolina State University, \$1,500, "Evolutionary response of predators to dangerous prey: Busyconine gastropods and their bivalve prey." Busyconine whelks prey on bivalves in two ways: thinner shelled species by wedging their shell between their prey's valves, thicker shelled species by chipping a gap at the valve margins. Whelks can sustain damage to their own shells in the process, hence the prey are considered dangerous. This study will consider whether whelks and their prey have evolved in response to one other, by examining the fossil record and by observing predation in experimental settings.

• **Erika V. Iyengar**, Cornell University, \$1,180, "Kleptoparasitism within the genus *Trichotropis* (Gastropoda), with specific studies on the evolutionary ecology of *T. cancellata*." *Trichotropis* can feed in two ways, suspension feeding and kleptoparasitism, stealing food from tube-dwelling polychaete worms. This study aims to determine the prevalence and benefits of these feeding modes and to construct a phylogenetic tree for *Trichotropis* to determine how the feeding behavior evolved. (See *Am. Conch.* 27(4): 14, 32 for Erika's report on the first part of her research.)

• **Steve I. Lonhart**, University of California at Santa Cruz, \$250, "Native and invasive predator preferences for Eastern Pacific trochids; effects of prey biomass and caloric value." In 1980, the whelk *Kelletia kelletii* invaded Monterey Bay, extending its range from the south. The invading whelk has prey preferences among five native species of *Tegula* different from those of native starfish. This study will look at the relative roles of prey defenses, caloric value of the prey, and edi-

ble tissue versus inedible shell volume in determining how predators choose their prey.

• **Russ Minton**, University of Alabama, \$500, "Phylogenetic revision of the pleurocerid genus *Lithasia*." The genus *Lithasia* consists of about ten species of freshwater snails endemic to the eastern United States. The species are generally rare and endangered and many populations and some species have gone extinct. This study will use morphological and DNA data to determine if the current species level classification of *Lithasia* is correct and to produce a phylogenetic tree of species and populations. This will help guide conservation and management efforts aimed at protecting the remaining diversity of *Lithasia*.

• **Ludwig Naegel**, Centro Interdisciplinario de Ciencias Marinas, Mexico, \$920, "Reproductive cycle of *Plicopurpura pansa* (Gould, 1853) from Playa Cerrito, Gulf of California, México." Overharvesting of the purple-staining pigment from *Plicopurpura pansa* led to the species' protection in Mexico in 1988 from commercial exploitation. The recovery of the snail populations, however, has been slow. Study of the reproductive cycle is necessary for management of natural populations and for starting a captive breeding program aimed at restocking.

• **Rebecca M. Price**, University of Chicago, \$1,500, "Columellar folds as an adaptation in the Fascioliariidae." Although columellar folds are a prominent feature of many gastropods, their function is unknown. The Fascioliariidae are a promising group for examining their function because of a variety of fold morphologies (including lack of folds, e.g. in *Fusinus*). This study will use three dimensional X-ray techniques to quantify fold shape in fossil and living species without damaging specimens. Data on morphology will be combined with that from experiments on function to show how the columellar folds influenced the evolution of the Fascioliariidae.

• **Kevin J. Roe**, University of Alabama, \$850, "Phylogeny and zoogeography of the freshwater mussel genus *Ptychobranchus* Simpson (Bivalvia: Unionidae)." The genus *Ptychobranchus* has an interesting distribution, with one species in each of five different river systems that drain from the Central Highlands of the United States on either side of the Mississippi River. This study will generate DNA sequences for these species to determine if their pattern of relationships corresponds to that of other species endemic to the same river systems.

• **Rebecca J. Rundell**, University of Hawaii at Manoa, \$1,500, "Phylogeny and origins of diversity in the endemic Hawaiian Succineidae." The succineids are one of the few groups of Hawaiian land snails that have not suffered extensive extinctions. The group has radiated widely in the Hawaiian Islands, occupying habitats from rain-forest to arid coasts. This project will study how species level diversity is generated, by constructing a phylogenetic tree using DNA sequences and by evaluating range sizes of the species based on museum specimens. Older islands are hypothesized to have species with smaller ranges, since there has been more time for specialization to evolve.

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sensation: an image-rich piece on Cypraeidae protoconchs illustrating both intracapsular (direct or crawl-away development) and planktonic (typical veliger type development). His last image in the article is a rare picture of a pediveliger of *Cypraea (Erosaria) labrolineata*, taken with a scanning electron microscope. It's hard to believe that this trochid shaped shell with strong cross-hatchings of axial and spiral ridges will become an elongated, glossy-surfaced cowry! This is one of those sites you will want as a ready reference. Let us all hope Felix doesn't tire of the effort, as I for one would sorely miss this great web page.

So there you have the shell related web sites for this issue: four different sites, each one an embodiment of what the Internet ought to be but often falls short of: quality presentations.

In Memoriam

Wilma "Butch" Young

Charles Cardin

Harry "Chip" Chippeaux

For color! "centerfold" this issue, please see pp. 28-29.

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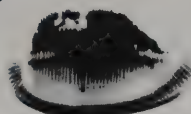
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CONCHOLOGICAL BOOKS:

A bookseller's perspective

By Tony Swann

Illustrated with photos by S. Peter Dance

From a talk given by Tony Swann of Wheldon & Wesley Ltd, England's most esteemed sellers of natural history books, to the Conchological Society at the Natural History Museum 18th January 1992

To some, antiquarian book selling may sound a faintly dull occupation. However, I received the invitation to speak to you while in New Zealand on a buying trip to the Far East. I had gone to Japan for 10 days to a booksellers' Congress where I not only had the delight of viewing the gardens and temples of Kyoto, but also managed to line up an order for a set of *Curtis's Botanical Magazine*. I went on to Australia where in Sydney I met a descendant of one of the editors of the *Journal de Conchyliologie* and bought a complete set of the Journal as well as many other fine shell books such as Born, Buonanni and Lister. In fact I managed to keep 22 business appointments over six weeks in Japan, Australia and New Zealand with substantial purchases resulting. Two years ago I spent ten intensive but pleasurable days in America appraising and valuing the largest private collection of shell books in the world. You can imagine from this that book selling is anything but dull—a lovely job and in the course of my work I have at least looked at nearly all the great and small shell books one is likely to see on the market.

By the end of this talk I hope to have given you an idea of how Wheldon & Wesley operates, what sort of people we are and also to have commented on many of the major shell books one is likely to see offered for sale these days. I respectfully ask you to remember at the outset that as a buyer for Wheldon's I have to cover the whole field of natural history books. I am not a "specialist" in shell books, as I could be faced tomorrow with a room full of books on coleoptera or cryptograms and the following week on birds or fish, so I know a little about a lot, not a lot about one particular narrow aspect of books. You will see as this talk develops how I cope with that.

Two years ago Wheldon & Wesley celebrated its 150th anniversary. We date our origin to a book shop opened by William Wesley in the brewing town of Burton-on-Trent in 1840. I have recently learned that Alfred Russell Wallace, then aged 17, spent some time in the town when first developing an interest in natural history. It would be nice to think that he found food for thought in our shop.

John Wheldon was born in 1807 and from 1823 to 1843 worked as assistant to three different booksellers before setting up on his own in London. The first real record we have of his business is a catalogue issued in 1857.

Wesley's trade in the earlier period seems to have been mainly new books and some wholesaling, whereas from about 1865 Wheldon's catalogues are almost all devoted to natural history and other sciences and by his death in 1892 he had issued 132 of them. As his epitaph one might quote the words of the great ornithologist and book collector Alfred Newton. In 1905 he wrote to a friend advising against asking around for a book he wanted, "As that only induces the people to raise the price. I think I know but one man who could be trusted not to do so. That was old Wheldon of Great Queen Street, Lincoln's Inn Fields. He has been dead for some years now but the shop still goes on and I believe in their principles."

Wheldon's manager John Edwards became proprietor on Wheldon's death in 1892 and in 1904 he was joined as partner by Harry Kirks Swann, my grandfather, who became sole proprietor of

John Wheldon & Co. after Edwards died in 1916.

By 1920, when the book trade had recovered from the effects of the war and was expanding on a world-wide basis, both H. K. Swann and Wesley's son Edward, who succeeded his father in 1891, decided the two firms had so much in common they ought to unite and in February 1921 the company of Wheldon & Wesley was incorporated. The last Wheldon catalogue, issued at the end of 1920 and overprinted with the name of the new firm contained 2,000 items of invertebrates, among them a coloured copy of Born, the *Journal of Conchology 1874-1918*, Donovan's *British Shells* and a Perry.

Kirke Swann died in 1926. Control of the company fell into the hands of one W.J.C. Craddock who was an able salesman but a disastrous manager. Eventually Kirke Swann's widow Emma was forced to sack Craddock, install herself as Chairman and her son Charles as Managing Director, just in time to save the firm. That was in 1930 at the height of the great depression when even the best managed companies had difficulties. During the second world war the business just ticked over from a warehouse on the North Circular Road. Emma Swann died in 1943 and her sister kept things going until the war ended.

In October 1945 Charles Swann returned from service with the R.A.F. and was joined in the business by his brother Howard, my father, who is still very active in the business at the age of 72 and is present here this afternoon. It was at this time that we saw a sustained

rise in company fortunes. Although there were few fine books in stock there was a considerable quantity of the sort of scientific books and periodicals which were greatly in demand. There was also a healthy cash balance at the bank instead of a crippling overdraft. The firm's long reputation as a specialist brought its reward in the form of opportunities to buy collections it had helped form in the past.

First among these was the mollusc library of E.R. Sykes, probably the finest and most complete on the subject ever formed by one man, the subject of an Appendix in the second edition of S.P. Dance's *History of Shell Collecting* (1986). I am indebted to my father for some reminiscences. In 1947 he was summoned by letter to a beautiful old manor house in Dorset. Sykes' family's bank was one of those amalgamated to form Barclay's.

My father had only been in the business a couple of years but Sykes and his wife treated him like an old family friend. Sykes took my father through all his books, the great feature of which was that Sykes had had the bibliographer Sherborn to stay with him and annotate

many of them inside the covers with pencil notes. All the books were listed by my father who then returned to the office and worked out a price with his brother Charles which in due course was accepted. It was described as "the most marvelous library on the subject you could imagine. He had every book—except Poli." He had not only the first edition of Martini and Chemnitz in 12 volumes but also the second edition, which ran from 1838 to 1920 in 40 volumes and we have only ever once had another set of that.

As for Reeve's *Conchologia Iconica*, Sykes was on his way to the bank in London one day and he walked along Farringdon Road where there was a book market. On one barrow he saw a volume of Reeve, so he asked the man if he had any more and was told "Oh yes, I've got a heap of them!" The man took him to the shed where he kept his stock and there was a large part of Hanley's library. Among many other things was a complete set of Reeve. Incidentally, Peter Dance has pointed out to me he believes that much or all of the Hanley library was originally acquired by a bookseller in Penance, so some research is needed there.

For the whole library in 1948 we gave about £1,500, a lot of money in those days. Apparently Sykes had bought the majority of his books from Wesley before 1914 so even then we were very much in the busi-



Strombidae plate from Martini and Chemnitz's *Conchylien-Cabinet*, 1773.



Plate 36, Vol. 2. Cassidae
from Martini and Chemnitz's
Conchylien-Cabinet, 1773

ness of "recycling" collections from old customers. If you read Peter Dance's Appendix you will find our catalogue of this collection even more astonishing when you realise that many of the finest books had already been sold to our then two most important customers for the subject, the Field Museum in Chicago and the Allan Hancock Foundation whose library is now located in the University of Southern California.

Sykes' fine dedication copy to the Empress of Austria of Born's *Testacea*, bound in red morocco with the imperial eagle on the covers, went to Stillman Berry in California for £15. Berry competed for the books with the notable col-

lector Dr. Irene A. McCulloch whose personal library is in the Santa Barbara Museum of Natural History.

Many books went to J. R. Tomlin, whose library is now in the National Museum of Wales. A friend of Nora McMillan's who knew Tomlin as a young and handsome man is quoted as saying "Tomlin would flirt with a broomstick if it wore a skirt." Albert Salisbury was another good customer. My father describes dealing with Sykes' library as his biggest education in shell books because, under his elder brother's guidance, he wrote practically the whole section of catalogue 67 which contained it, using what Sykes had told him and Sherborn's notes inside the covers.

A little later we bought the library of Baini Prasad, Director of the Zoological Survey of India, not in very good condition but a considerable quantity of books, mostly on mollusca.

The next really big collection was the Conchological Society's library, about 1957. There had been quite a discussion in the Society's Committee as the library had been stored for years unused in a cellar at the University of Leeds. The university wanted the space and no one in the Society would look after it, because like many amateur societies it had no home. It was therefore decided to sell the books and use the money for promoting the other activities of the society. When my father went up to look at the books many of them were lying on the basement floor and, with the pollution from coal in Leeds some 50 years ago, it looked as if someone had sprinkled soot all over them. We spent a lot of time cleaning them. A copy of Sowerby's *Thesaurus* for example, in nice red morocco, had to be washed with saddle soap to get the binding in saleable condition. This collection appeared in our catalogue 88 of 1958 when the attractive Swainson *Exotic Conchology* 2nd edition of 1841 was offered for £15.

Then came the collection of Ronald Winkworth, one of the two secretaries of the Royal Society. He had died some ten years before and his widow had not wanted the books moved, keeping them as a sort of memorial to her husband. When she died we dealt with Winkworth's nephew and it was a good collection. Many papers of which he did not have a printed copy he would write out in longhand in a beautiful script. The nephew was astonished by how much we were able to give him for these books. Nora McMillan remembers staying with Winkworth and his wife and taking some Races to be identified, which Winkworth promptly named. She exclaimed "But these are not the names in your list" (that is the List of British Marine Mollusca in *J. Conch.* Vol 19 1932) to which he replied "I don't use those names. I use Jeffrey and translate!"

Perhaps the last major mollusca library we bought was that of Albert Salisbury in 1964 after the company moved to Laden Lodge. Salisbury used to arrive at our premises in an ancient car and was always smart in his appearance. It was a large house in which the

books were located, but in an extraordinary mess. Again my father dealt with the nephew who said, "My uncle's wife died on their honeymoon about 1900 and he never married again, although he did have a housekeeper until recently." One of Salisbury's other hobbies was the organ and the drawing room had a fair sized organ built into it. His study was so cluttered that he ended up with a desk on the landing outside and the latest acquisitions of shells and books were in orange boxes on the floor. In the drawing room the sofa and armchairs were piled high with numbers of the various journals which he took. Some of his books went to the Royal Scottish Museum but we got the majority. My father remembers him as a charming man and Nora McMillan remarks that he also invented the immersion heater.

All this was before my time. I joined the firm in 1974. My degree was Politics and after Reading University I went to the R.A.F. College Cranwell, graduating as a pilot but finding I was emotionally unsuited to a military way of life, I resigned during advanced training. I taught English in Bordeaux for a few months after leaving the Air Force but soon concluded there was little future in that. I came back to give the family business a try and have now been a bookseller for nearly 18 years, having been promoted to Director in 1983. I am delighted to say I have found my niche and thoroughly enjoy my job. Fortunately I quite rapidly developed, not just a love of books, but a feel for books and their importance and value which is not quite the same thing. Perhaps I could explain that a bit by saying my customers are sometimes puzzled when I offer more—or less—than they think a book is worth. I occasionally have to explain that a bookseller's perspective on a work might be different from that of the enthusiast or working scientist and I may sometimes have a different idea of its value, based on what I think we can sell it for. Naturally I cannot carry the price of every one of the many thousands of books I handle over the years in my head but that "feel" for books I mentioned means I very rarely make major mistakes.

There have been significant changes in the market since I joined Wheldon's such as increasing competition from the auctioneers (now checked by the recession and lack of books for sale) as well as the growing impoverishment of academic institutions around the world. By the early '80s I had acquired a good working knowledge of our field and developed the initiative to begin buying and selling. I soon found it is enormously satisfying to purchase a book in Hitching, or Milan, or Sydney, knowing it is a good buy, having the pleasure of handling and collating it and then passing it on to a customer who might have been looking for it for years and would be delighted to have it. It is a characteristic of the trade that in the larger antiquarian book shops you usually find a number of people who are unambitious and apparently happy to stay doing routine clerical work. However, it is essential you have at least one member of staff who is prepared to jump on a plane to Stockholm or Paris at short notice and get out there to find the books. It is of course also essential that one has the supporting staff to help process and sell the books when you have bought them. The key though, without a doubt, is buying. If you have a good book at a reasonable price there is little difficulty in selling it. The problem increasingly, indeed the general lament from the trade these days, is the difficulty of finding good stock. I am off to Cape Town and Mauritius on Monday to try and ensure we continue to maintain a good stock. (No shell books in prospect there, I'm afraid).

This article will conclude in the December Issue.

EXOTIC CONCHOLOGY:

FIGURES AND DESCRIPTIONS

RARE BEAUTIFUL OLD SHELLS

Shells.

BEING AN ESSAY ON THE HISTORY OF THE SHELLS OF THE

WILLIAM SWAINSON, F.R.S. & F.L.S.

Vol. I

Title page of the first edition,
first issue of Swainson's
Exotic Conchology, 1821.

CONCHATENATIONS

by Gary Rosenberg

Night of the Living Snails

I first collected at night more than twenty years ago, snorkeling in Piti Bay, Guam. The diversity amazed me. I found dozens of species: *Mitra*, *Vexillum*, *Terebra*, *Conus*, and others. There was no need to fan sand or dig in rubble because the animals were crawling about openly in the sand among the coral heads. The imagined possibilities of a shark lurking in the dark or malfunction of my underwater flashlight added to the excitement.

Despite the good results I (and many others) have had collecting marine mollusks at night, I had not tried collecting land snails at night, other than on the grounds of a hotel, until recently. I have been doing field work for land snails in Jamaica for many years, but the routine of diurnal collecting makes it difficult to get out at night. We usually sample at five or six sites a day, so evenings are spent preserving the snails and processing leaf litter samples. Since it is difficult to navigate and almost impossible to choose sites at night, nocturnal collecting is limited to sites already sampled, or at least located, during the day. Only one or two sites can be sampled per night. Adding to the inertia of the efficient routine of diurnal collecting was the threat of swarms of mosquitos, which are bad enough during the day, and of danger to life and limb hiking in the dark in jagged terrain.

The opportunity to go snailing at night presented itself in May of this year, when we were staying at the Windsor Research Station on the northern side of the Cockpit County, a karst area southeast of Montego Bay. The research station is the last outpost of civilization (indoor plumbing having arrived earlier in the year, but not yet hot water); it is only a quarter mile from primary forest. Using headlamps and flashlights, Igor Muratov and I hiked in along the trail that leads to the entrance of Windsor Cave. As we crossed from the surrounding field into the forest, we felt the telltale crunch of snail underfoot. *Pleurodonte* were everywhere. These camaenids are the commonest large snails in Jamaica, so we had expected them, but it was disconcerting to find them so abundant that it was difficult to avoid stepping on them as we went farther along the trail.

The next snail we found alive, also a camaenid, did surprise us: adult *Eurycratera jamaicensis*. With a globular shell as much as 6 cm across, it is the most massive native snail in Jamaica. We had found the daytime habitat of this species only a week before: it hides far under large rocks, or hangs from the roofs of deep crevices in limestone faces, where it cannot be seen without a flashlight. On eight previous trips to Jamaica, I had never seen a live adult of this species, and had found only a few live juveniles, although dead shells are not uncommon in some areas. To see half a dozen of them out crawling at night around Windsor Cave was exhilarating.

Another surprise was the pleasantness of night collecting: ten degrees cooler than during the day, and no mosquitos in evidence. Mosquitos in the Cockpit Country, we learned, fly during the day and at dusk, but not at night. Also, with so many snails crawling about, we didn't have to work up a sweat turning logs and rocks to find them.

We did not find any species at night that we had not found by day at the same site, but we found several alive that we had found only dead there before. Many species, however, were not crawling where I expected them. I had thought of most sagdids as rock-dwellers since by day we usually found them under rocks. *Sagda pila* has a fuzzy brown periostracum that makes it look like a little blob of mud on the

underside of a rock. *Corneosagda ptychodes* is similarly camouflaged, with particles of dirt adhering to the shell. Another sagdid, *Zaphysema*, is almost always found in the leaf litter by day. At night all three were crawling in the herbaceous layer, relying on cover of darkness to hide them against the green leaves. Other species crawling on the leaves included the helicinids *Alcadia* and *Lucidella*. Despite all the snails on leaves, we did not observe them (or any other species at the site) eating live leaves. Perhaps they were browsing on algae growing on the leaf surfaces?

I had categorized *Thelidomus aspersa*, a large white camaenid, as a tree snail, since we saw it everywhere in trees by day. At night they crawl about on the ground, challenging my assumption that they are arboreal lichen-feeders. Perhaps instead they feed on earthbound leaf-litter and use the trees only for shelter. Shortly after dusk I saw a train of a dozen *Thelidomus* crawling down a tree trunk to the ground, which made me wonder if the same dozen would be back in that tree in the morning. Some mark and recapture studies are in order.

Other species were noticeably absent that night. We did not find any live *Varicella* although a dozen species of these carnivorous snails occur in the area. This suggests that their prey are not active at night. The operculate *Annularia fimbriatula* is commonly found in the area by day, but we did not see them alive at night. Pulmonates far outnumbered operculates at night, whereas operculates are more likely than pulmonates to be found active during the day. This might help explain why the Jamaican fauna is so diverse, with 500 endemic species of snails, about half of them operculates. Perhaps the operculates are primarily diurnal and the pulmonates primarily nocturnal, the temporal separation reducing competition.

Surprisingly, we saw only one instance of copulation among pulmonate snails that night, a pair of *Sagda grandis*, our first observation of reproductive behavior in a sagdid. In contrast we often see mating among operculate snails, particularly annulariids and truncatellids, by day. One other absence was micromollusks, those species under five millimeters in length. These perhaps were active but camouflaged on soil or in leaf litter, but were not evident on leaves or rock surfaces. Their small size restricts their mobility, which might dictate their remaining close to shelter to avoid desiccation.

Overall, collecting at night gave us a much better understanding of the ecology of the species. If anything, it was easier than collecting during the day, aside from the difficulty of reaching a site at night. Also, it was less destructive to habitats in that we did not turn rocks or logs, or dig in rubble or leaf litter. Of course we try to minimize the damage of such activities during the day by replacing these substrates where we find them; also it might be worth investigating them at night to see what is not active. Collecting at night did not change our perceptions of diversity, but it greatly affected our ideas of the relative abundance of species and how they interact with the environment. Clearly it was worth breaking our routine.

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Book Reviews:

***Seashells of South-East Australia* by Patty Jansen. Capricornica Publications, Lindfield, NSW, Australia. Feb. 2000. pp. 1-118 (+vi) with 47 color plates and numerous color illustrations. 135 x 208 mm. Soft cover. ISBN 0-9577455-0-8. A\$29.95.**

Patty Jansen describes her latest book: "The first colour book ever written on the shells of South-East Australia, this book is a field guide for beachcombers, students of all ages, divers or anyone else interested in shells and their inhabitants." She doesn't mention the fact that it is also small format, handy to carry along. Another plus, its broad range of usefulness: the 414 species included represent 90% of the over 10mm species found in shallow water or on the beaches of the area in question, New South Wales to Western Victoria and Tasmania. Many of these species also can be found ranging to southern Western Australia and north into Queensland.

A shell collector from the age of nine, who has been educated as an agricultural scientist, Patty is also a natural history book dealer and publisher, as well as a fine artist whose drawing adorned a 1996 cover of *American Conchologist*, and she is a computer and layout whiz! Her tireless energy has given us two other excellent little books on the shells of Australia, *Seashells of Central New South Wales* and *Common Seashells of Coastal Northern Queensland*.

The contents of the book is conventional, and so it is familiar and easy to use. An attractively illustrated introduction about mollusks and shelling is followed by the systematic guide. The text faces the plates to enable easy identification. Description, size and complete range are included, including distributions outside Australia. Each species covered is nicely photographed and large enough to recognize. There follow a list of further reading and an index and a list of Australian Shell Clubs, with contact addresses. Although undeniably helpful to travelers, one wonders how long the contact list will stay effective, given shell club officer changeover. Note that the emphasis is on temperate beach and shallow water shells, so while Trochoidea and the limpets are well represented, cones, murex and cowries are few.

A couple of typographical errors have crept into the book, but they shouldn't interfere with its use. All considered, this is an excellent product with many uses. At about \$18.00 U.S., the price of an inexpensive shell or two, this fine little book is an investment that any collector of Australian shells will surely wish to make. —LS

RECENT XENOPHORIDAE by Kurt Kreipl & Axel Alf. ConchBooks, Hackenheim, Germany. ISBN 3-925919-26-0. 213 x 300 mm, hardcover, 148 pages, incl. 28 colour plates and 64 b/w text figures. Approx. \$70.

After Ponder's 1983 revision, this is the second review of this rather small but interesting family of Gastropods. The book starts off with a foreword by Winston Ponder, followed by an introduction to the family, which discusses the theories on the strange behaviour of these molluscs, i.e. the attachment of foreign objects to their shells. An identification key (in English, German, French and Italian) is provided, and this is followed by descriptions of all (26) recent (sub)species assigned to this family, complete with reference to the original description and synonymy, followed by a chapter on the geographical distribution of the species. There follow the colour plates, with each species illustrated in three views, and some additional specimens showing the vari-

ability of the species. A bibliography and an alphabetical list of all recent taxa completes the book.

There are a few differences from Ponder's treatment, viz. the recognition of *Stellaria* and *Onustus* as genera (Ponder considered these to be subgenera), the division of *Xenophora* into *Xenophora* s.s. and *Austrophora* and the recognition of *X. (X.) senegalensis* as a species, and not a synonym of *X. (X.) crispa*.

The descriptions are brief and clear. As some species of *Xenophora* are rather variable, or resemble other species, it is good to see that species are compared to these other, similar species. Accompanying b/w figures of the base of the shell (which often shows distinctive features) are very helpful. Very nice are the repro figures, a trend started in the earlier book on Cassidae (from the same publisher), sometimes beautiful engravings, and sometimes very confusing illustrations (e.g. repro 19, which illustrates *Onustus indicus* after Martini & Chemnitz, but which has no resemblance to a xenophorid at first glance).

Unfortunately, the book has major and minor flaws. Although it is mainly based on Ponder's revision, the paper by Ponder cannot be found in the bibliography, and on page 11 there is a reference to a paper by Faber, which, just like Ponder's work, cannot be found in the bibliography either.

On page 13 an analogy is made between Xenophoridae and the larval stages of Trichoptera (Arthropoda: Insecta), vernacular name caddisflies (in the book incorrectly spelled as caddie flies), a group of insects closely related to butterflies. Like many comparisons, this one isn't all that good. Xenophoridae attach foreign objects to their shells, the cases (in the book referred to as "caddies") of caddisflies are made solely of foreign materials. Moreover, the taxonomy of caddisflies at family level is based on the shapes of the cases and even species can be identified by their cases. Species of caddisflies have very narrow ecological niches, i.e. the bottom type, speed of running water, in which they live.

Text fig. 7 is a specimen of *X. (X.) neozelanica neozelanica*, text fig. 8 is a specimen of *X. (X.) crispa*; these are not *X. (X.) pallidula* as say the captions. Text fig. 20 is *X. (X.) peroniana kondoi* and not *X. (X.) neozelanica kermadecensis*. The caption of text fig. 30 unfortunately reads *Austropharpa* instead of *Austrophora*. Plate 4 illustrates *X. (X.) conchyliophora* form robusta (once described as a species by Verrill, and considered by some as the Panamic subspecies), but in the text there are no distinguishing features given for the "normal" form. Some of the colour illustrations are rather bluish, especially pl. 15, figs. 12a; pl. 20, fig. 18b (righthand bottom); pl. 28, fig. 26 (lefthand top).

Some of the captions of the repro figs. have no agreement in gender; e.g. repro 4, illustrates "*Phorus onustus* Reeve, 1842 = *Xenophora (X.) conchyliophorus* [sic] Born, 1870 [sic]"; in the same caption the brackets around the author of this species are omitted. Born originally described this species in the genus *Trochus*, so this caption should read "*Phorus onustus* Reeve, 1842 = *Xenophora (X.) conchyliophora* (Born, 1870), after Reeve, 1843..." In the identification key it would have been more logical to first "eliminate" *X. (Austrophora) flindersi flindersi*, as this species is the only representative of this recently described subgenus (distinguished by protoconch and operculum). Many of these smaller mistakes could have been avoided by having the text proofread.

Despite these flaws, this book provides a good tool for the identification of species of Xenophoridae for collectors. And, xenophorids are fun: suppose you collect Cancellariidae; how nice it would be to have a *Xenophora* with a *Cancellaria* attached! —Gijs C. Kronenberg

(More Book Reviews on page 30)

COA wishes to express its gratitude to all the many workers and organizations who made COA 2000 such a top-notch event and to thank individually the following people and organizations, who donated generously to the 2000 convention:

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(Lloyd article continued from page 4)

List of shells and number of each species obtained from tangle of tackle, seagrass, Busycon eggcase, etc. angled by C. M. Lloyd's son and lent to H. G. Lee on 4/27/00:

- 1 *Nucula proxima* Say, 1822 Atlantic Nutclam
- 3 *Brachidontes exustus* (Linnaeus, 1758) Scorched Mussel
- 11 *Musculus lateralis* (Say, 1822) Lateral Mussel
- 3 *Anadara ovalis* (Bruguière, 1789) Blood Ark
- 17 *Anadara transversa* (Say, 1822) Transverse Ark
- 1 *Carditamera arata* (Conrad, 1832) fossil
- 1 *Pleuromeris tridentata* (Say, 1826) Threetooth Carditid
- 1 *Crassinella dupliniana* (Dall, 1903) Pointed Crassinella
- 13 *Mulinia lateralis* (Say, 1822) Dwarf Surfclam
- 1 *Tellina versicolor* DeKay, 1843 Many-colored Tellin
- 1 *Donax parvulus* Philippi, 1849 Little Coquina
- 2 *Donax variabilis* Say, 1822 Variable Coquina
- 3 *Abra aequalis* (Say, 1822) Atlantic Abra
- 1 *Dosinia discus* (Reeve, 1850) Disk Dosinia
- 1 *Sphenia dubia* (H. C. Lea, 1843) Dubious Sphenia
- 1 *Litiopa melanostoma* Rang, 1829 Sargassum Snail
- 1 *Vermicularia knorrii* (Deshayes, 1843) Florida Wormsnail
- 3 *Littoraria irrorata* (Say, 1822) Marsh Periwinkle
- 1 *Caecum antillarum* Carpenter, 1857 Antillean Caecum
- 1 *Strombus alatus* Gmelin, 1791 Florida Fighting Conch
- 3 *Crepidula plana* Say, 1822 Eastern White Slippersnail
- 5 *Neverita duplicata* (Say, 1822) Shark Eye
- 431 *Tectonatica pusilla* (Say, 1822) Miniature Moonshell
- 9 *Epitonium* sp. aff. *albidum* (d'Orbigny, 1842) cf. Bladed Wentletrap
- 16 *Epitonium angulatum* (Say, 1830) Angulate Wentletrap
- 1 *Epitonium championi* Clench and Turner, 1952 Champion's Wentletrap
- 6 *Epitonium humphreysii* (Kiener, 1838) Humphreys' Wentletrap
- 7 *Epitonium* sp. aff. *marcoense* Dall, 1927 cf. Marco Island Wentletrap

- 3 *Epitonium multistriatum* (Say, 1826) Many-ribbed Wentletrap
- 1 *Epitonium novangliae* (Couthouy, 1838) New England Wentletrap
- 22 *Epitonium rupicola* (Kurtz, 1860) Brown-band Wentletrap
- 2 *Melanella conoidea* (Kurtz and Stimpson, 1851) Conoidal Eulima
- 4 *Melanella hypsela* (A. E. Verrill and Bush, 1900) Sharp Eulima
- 47 *Eupleura caudata* (Say, 1822) Thick-lip Drill
- 34 *Urosalpinx cinerea* (Say, 1822) Atlantic Oyster Drill
- 1 *Gemophos lymani* (M. Smith, 1936) fossil
- 5 *Polia tincta* (Conrad, 1846) Tinted Cantharus
- 38 *Busycon carica* (Gmelin, 1791) Knobbed Whelk
- 2 *Busycon sinistrum* Hollister, 1958 Lightning Whelk
- 8 *Busycotypus canaliculatus* (Linnaeus, 1758) Channeled Whelk
- 21 *Ilyanassa obsoleta* (Say, 1822) Eastern Mudsnail
- 133 *Ilyanassa trivittata* (Say, 1822) Threeline Mudsnail
- 2088 *Nassarius acutus* (Say, 1822) Sharp Nassa
- 6 *Fasciolaria liliifera* (G. Perry, 1811) Eastern Banded Tulip
- 269 *Astyris lunata* (Say, 1826) Lunar Dovesnail
- 17 *Costoanachis avara* (Say, 1822) Greedy Dovesnail
- 1 *Costoanachis lafresnayi* (P. Fischer and Bernardi, 1857) Well-ribbed Dovesnail
- 323 *Parvanachis obesa* (C. B. Adams, 1845) Fat Dove Shell
- 92 *Olivella mutica* (Say, 1822) Variable Dwarf Olive
- 22 *Olivella specimens* (an unnamed species)
- 7 *Terebra concava* T. (Say, 1826) Concave Auger
- 161 *Terebra dislocata* (Say, 1822) Eastern Auger
- 1 *Terebra protecta* (Conrad, 1846) Fine-ribbed Auger
- 1 *Cryptoturris dorvilliae* (Reeve, 1845) Dorvill's Mangelia
- 5 *Kurtziella limonitella* (Dall, 1884) Punctate Mangelia
- 1 *Rubellatoma rubella* (Kurtz and Stimpson, 1851) Reddish Mangelia
- 4 *Boonea impressa* (Say, 1822) Impressed Odostome
- 1 *Turbonilla (Pyrgiscus) wrightsvillensis* E. Powell, 1981 Carolina Turbonille
- 40 *Acteon candens* Rehder, 1939 Rehders Baby-bubble
- 1 *Acteocina bidentata* (d'Orbigny, 1841) Two-tooth Barrel-bubble

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Shelling in Ecuador Part II: Rediscovering Ecuador – 1995

by José Coltro Junior

During the next five years after our first trip to Ecuador, Marcus and I had opportunities to go shelling in great places like the Red Sea, Aruba, Costa Rica, Samoa, and Hawaii, but we always had Ecuador in our hearts. We really loved the country. Then in November 1995, we decided to return, but this time taking our former partner Luiz Marcio and our best diver Alfredo Bodart.

In 1993 we began contact with a shell collector in Guayaquil, Ecuador, Dr. Gustavo Noboa, the dean of the best Ecuadorian University, the Catholic University of Guayaquil. In planning our trip we had Dr. Noboa's help in many ways, especially with reservations and suggestions. When we arrived in Guayaquil, Dr. Noboa was there at the airport waiting for us. To put it plainly, after our first contact, Dr. Noboa adopted us! He is a great and a serious man, but also a man with a fantastic sense of humor. He took us for a dinner and city tour; Guayaquil had changed after 5 years and we were happy with the changes. Other good news was about the roads – all very well paved. We made an appointment to visit Dr. Noboa at his beach house the following week and we left Guayaquil for La Libertad. But he warned me to watch for donkeys crossing the roads and to be careful around the crazy Ecuadorian drivers!



Near La Libertad: Danger! Ecuadorian Drivers and Donkeys

La Libertad had also changed a lot—in 1990 the town was really simple and poor. Now it had grown a lot—many new buildings, banks and even a shopping mall! The hotel was still there, but unfortunately it didn't change. It looked rather abandoned, but "our rocks" were still there!

Very early the morning after we arrived we went to snorkel. It was a shock. Walking among the rocks were dozens of the people collecting everything. I questioned them and learned that they were there trying to find some food for the day. In the bags, buckets, and hands I saw shells, sea-urchins, baby octopus, chitons, etc! They cleaned "our rocks" at low tide. We didn't find many shells and we were very disappointed.

We decided to rent some scuba equipment and I found a good place in Ancocito (the blood beach). When we arrived we found the town was just as messy as ever, but much bigger. We located some divers and we rented the boat—excuse me, the panga—and the dive equipment for Luiz and Alfredo. They went to an outside rocky reef while Marcus and I scouted for new snorkel spots.

In 1990 we stopped at a beach there called Ayangue. It is a very enclosed bay with a sand beach. At that time we weren't comfortable there because the beach was full of street dogs which didn't look friendly. This time we had a nice surprise: the beach was clean, and had acquired a few restaurants (nothing fancy) and the bay looked like a swimming pool. We returned to Ancocito to pick up Luiz and



Ancocito, Ecuador

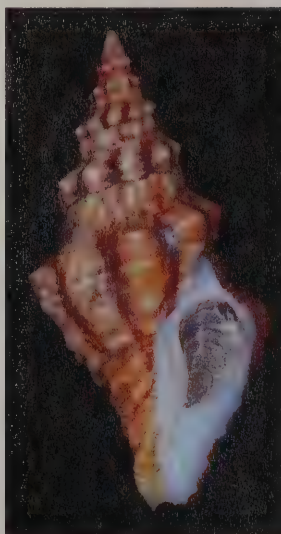
Alfredo, who had found kilos of wonderful shells. *Cypraea*, *Conus*, *Turbo*, *Jenneria pustulata*, etc. They complained only about the water temperature—cold!

Next day we went to Ayangue where we had a great snorkel day. We parked the car in the sand beach close to a local restaurant. We donned our skin diving equipment and suddenly the entire village was there looking at us! We were really funny to those people. The water wasn't too cold and we found many *Conus* and some other species. But the really special find was huge *Conus fergusonii* found in colonies in rock crevices on a sand bottom. On this day Marcus got a bad cold.

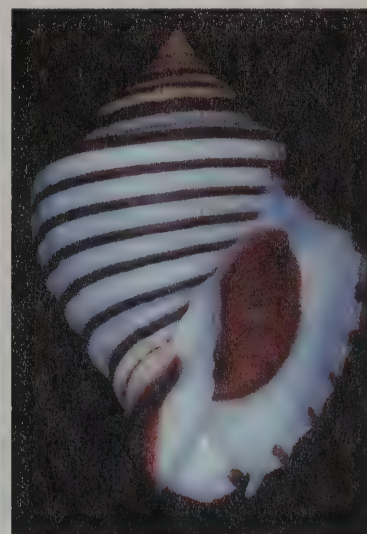
We had a very nice weekend with Dr. Noboa at his beach house in Punta Blanca. Marcus, Alfredo and Luiz wanted to snorkel on the rocky reef not far from the beach. They found many species, especially *Conus princeps lineolatus* and large *Opeatostoma pseudodon*. We received Dr. Noboa's permission to return later in our trip.

After that weekend we headed north out of La Libertad in hopes of trying a dive around Salango Island—a large, beautiful island very close to the coast. We tried in 1989 but we couldn't find a boat to take us there. Salango is a small village in a beautiful bay. We couldn't find a place to stay but a few kilometers away in Montañita, a famous place for the surf, I found a nice, brand new hotel. We took rooms there and returned to Salango to find a boat to rent.

Five years before we had made a short visit to Salango—the village has an interesting archaeological museum devoted to the local pre-Colombian culture. At that time we met a diver who sold us few shells. He had moved to the Galapagos, but his brothers, all divers, were still in Salango. They helped us rent a boat and suggested we try to dive at



Leucozonina cerata



Opeatostoma pseudodon

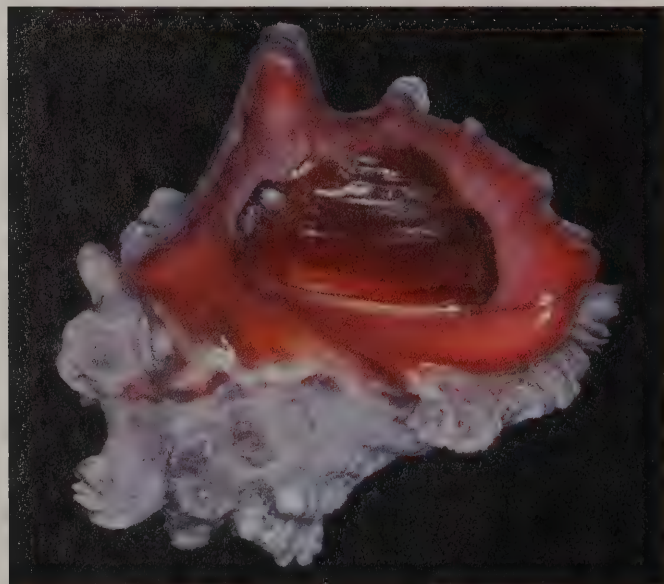
*Thais planospira*

Isla de la Plata, a very large island 45 km offshore. We agreed to both their idea and the rental prices and we planned to return very early the next day. On the way back to the hotel I had a terrible contact with a huge tarantula crossing the road. I was so afraid that this monster could jump to the car that I turned aside and I almost killed everybody in the car! (Remember that I have this grudge against spiders!)

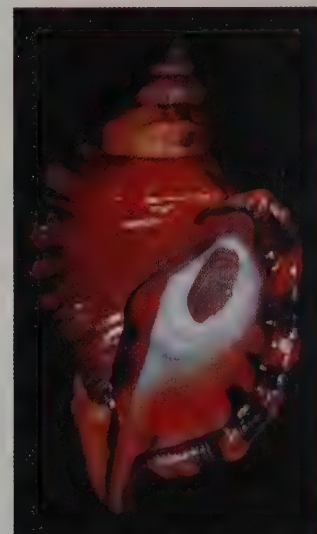
Marcus' cold was worse and he stayed in the hotel to rest and to clean some shells. I went with Alfredo and Luiz early morning and when I saw the boat...er, the panga...that was available, I almost gave up. A small fiberglass boat, about 6 meters long and 1.5 meters wide, it was completely open. Well, I thought, last try! I'd better give it my best. Besides the three of us, two local divers, Juan and Dower, went with us. Five people on this little boat! I took my Dramamine, because I get seasick extremely easily. I sat on the boat floor and slept most of the hour and half it took to reach the island.

We couldn't land on the beach—Isla de la Plata is an archaeological National Park. For hundreds of years this island was a very important commercial center, trading with most of the pre-Colombian cultures. They traded shells! They had large *Spondylus calcifer*, considered a sacred shell, which they used to make jewelry and special handcrafts. The island has large and important archaeological sites. To land there, special permission is necessary.

We stayed near the island. Alfredo and Luiz went off to dive using

*Neorapana muricata*

a very good compressor while I snorkeled around the rocks of the island. Dower told me that the sea around the island was incredible. Normally rough with waves crashing hard on the rocks, it was a beautiful swimming pool that day. As I snorkeled around the rocks I found large *Opeastostoma pseudodon*, *Leucozonia cerata*, and *Neorapana muricata*. Even though Dower considered the sea very calm, sometimes the waves pushed me into the rocks. On one of these occasions I spotted an unusual shell in a rock hole. I tried to get the shell out, but the waves were a bit too strong. To me the shell looked very much like a huge *Drupa*, but I thought: "There is no *Drupa* in the Western Pacific!" Finally I got the shell, one the best surprises in my life: it was a huge and extremely beautiful *Thais planospira*. I was so excited that I forgot about the waves in trying to find more specimens. After five hours I had twelve specimens and lots of small cuts over my entire body.

*Conus princeps lineolaris**Cymatium tigrinum*

Back at the boat Alfredo and Luiz couldn't understand why I was being smashed by waves onto the rocks. But when I returned to the boat they couldn't believe those shells! Suddenly the weather and the sea changed and huge waves started to pound the rocks and we had to leave. I was so tired that I didn't see the material that the others collected. I took my place on the boat floor, covered by a plastic and slept all the way back. I didn't see or feel the rain, waves, or cold, or anything else. It was late in the afternoon when we arrived in Salango and I finally saw the beautiful material they had collected. The most outstanding species was a beautiful and perfect *Cymatium tigrinum*. I wanted to return to Isla de la Plata the next day but Dower told me that weather would be terrible offshore. He suggested diving around Salango Island instead and we agreed. It is just 5 minutes offshore.

*Porphyrobaphe iostoma*



The rain forest between Quito and Santo Domingo

All during the previous day Marcus and I noticed a special rivalry had developed between Alfredo and Luiz over which one was the best sheller each day. Luiz was mad because when he collected one bag of shells, Alfredo brought in 5 or 6 times more, and he always had the best shell of the day. I consider Alfredo one of the best shell collectors in the world. I call him the "human dredge." It is quite interesting to see him collecting shells. He has a fantastic eye for it!

Next we went to Bahia de Caraquez. Again, it was quite nice to return. The city had new beautiful buildings, hotels, etc. The nice hotel we remembered from our previous trip was there, and it was good as before. The only problem was that the beach at the hotel front had disappeared! They had to use huge rocks to keep the sea out of the hotel. Those rocks worked a change on this part of the beach. On our first shelling day there we found many nice shells on the rocks. We also found a beautiful sea snake leaving the sea to lay eggs on land. It was the first time I saw one. The animal was so beautiful – black and yellow. I knew that during this time the snake is especially dangerous so we left it to do as it willed.

Next day we drove the car on the beach looking for indications about the tide. We knew from our first trip that when we saw people making their way rapidly back to the city it was time to be back. The high tide has really strong waves which could cover the entire beach. We stopped to open the soft-rocks to look for bivalves like Pholadidae. We found some great species. We also found some fossils on the rocks, most of them shells. We met a young man who took us to his special park. The coast in Bahia de Caraquez has an interesting dry forest with some large, thick-trunked trees. We found just a few land shells, mostly dead. Of course we found some *Porphyrobaphe ios-*

toma. Each part of the coast has a different population and we had collected some in the Salango area, the Jipijapa area and now in Bahia de Caraquez.

We left Bahia de Caraquez for Quito in the high mountains. When we started the trip, everything was dry and brown. When we arrived in Santo Domingo de los Colorados, the landscape had started to change to a lush green. Santo Domingo looked like a city after 100 years civil war! It was so messy, dirty, really destroyed in comparison to Bahia de Caraquez. But we were tired so we found a good hotel and spent the night there.

As we left Santo Domingo, the landscape started to change dramatically. A beautiful tropical rain forest started to appear. Thousands of colorful orchids decorated the roadside. Fantastic views of mountains, valleys and rivers brought us to a stop many times. We tried to look for some land shells, getting permission from a local farmer to walk his land. Marcus didn't want to go, but I, the idiot, decided to accompany Luiz and Alfredo. The forest was covered by spiders webs, and full of spiders. I couldn't move. I had to have Alfredo's help just to leave there. And, of course, I had to listen to the jokes about that the rest of the trip! They found some beautiful live *Drymaeus aequatorianus*. We continued our trip up the hill, stopping at each likely spot to look for shells. The road was really dangerous. We saw many serious accidents along the way, most of the time involving large trucks. We met a young man along the way whom we asked about shells. He told us that he saw many. I got him to agree to collect all he could before our return in two days.

The landscape started to change again and a new and very different flora started to appear. The weather had changed to a cold afternoon when we finally arrived at Quito, over 3,000 meters high. We could feel that after a few days; there is less oxygen and we felt tired most of the time. But it is a nice city with interesting historical and modern sides. We checked into a hotel and started to pack our messy stuff to send back home. Marcus decided to clean all the shells he could so our room smelled really bad.



The llama farm

With three entire days in Quito, I wanted to visit the Vulcan Cotopaxi, not far from the city. It is a very high and beautiful snow-capped mountain. On the way we stopped at a llama farm—quite interesting animals! We drove up the mountain through a very unusual landscape, beautiful but completely different from anything I've ever seen, the most exquisite flora! It resembled an old Star Trek set with its unusual colors and rock formations. We stopped the car and decided to climb the mountain up to the second station. It wasn't hard because the mountain has a nice trail that goes that far. A shorter path exists too, but not such an easy one. The second station was at 4,200 meters. We started out with Marcus, Alfredo and Luiz walking fast and I, the fat one, walking behind. After two hours walking we reached the first snow. Alfredo and Luiz never had seen snow, and started to play in it.



An orchid from the Andean Rain Forest

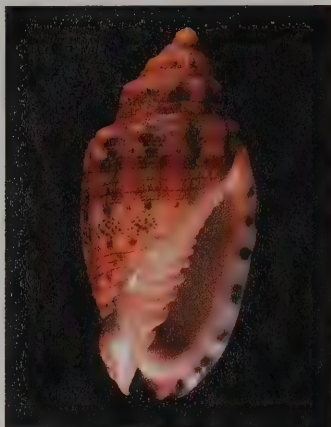
(Continued on page 31)

THE *VOLUTA MUSICA* COMPLEX

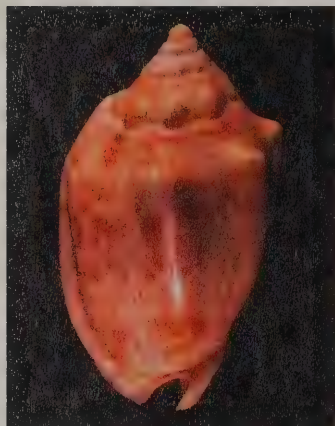
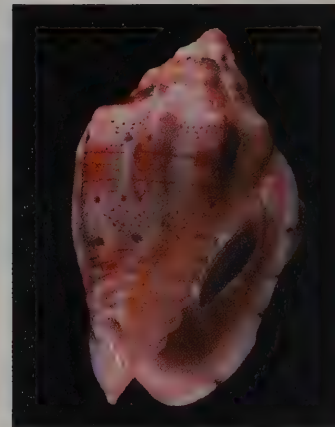
by Kevan and Linda Sunderland



Voluta musica form *carneolata* Lamarck, 1811. 83 mm. 400', off Bridgetown, Barbados.



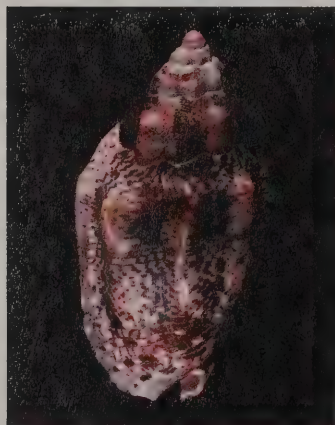
Voluta musica form *carneolata* Lamarck, 1811. 58 mm. 5', near Bridgetown, Barbados.



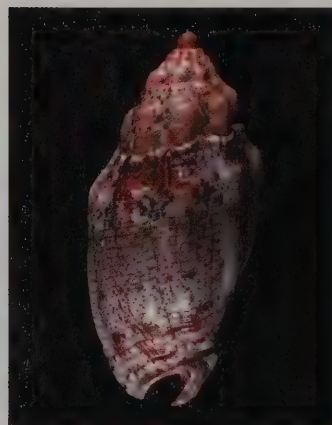
Voluta musica form *carneolata* Lamarck, 1811. 68 mm. 3', Chacopata, Venezuela.



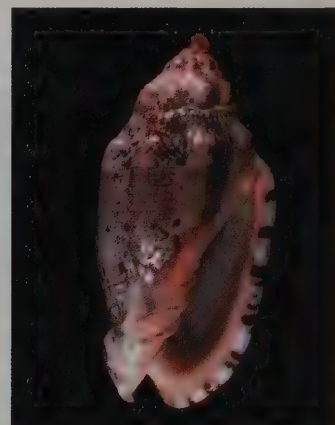
Voluta musica form *thiarella* Lamarck, 1811. 68 mm. 80', in sand, Bay of Trinite Village, Martinique.



Voluta musica form *thiarella* Lamarck, 1811. 76 mm. 40', in sand, Grenada.



Voluta musica form *thiarella* Lamarck, 1811. 70 mm. 20', in turtle-grass, south coast of St. Lucia.



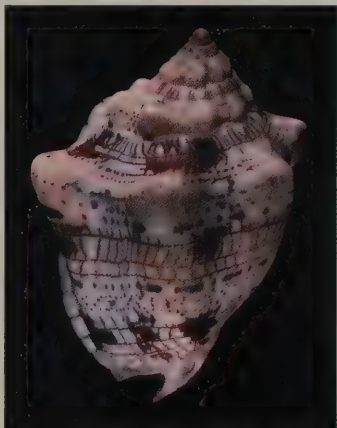
The intent of this feature is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



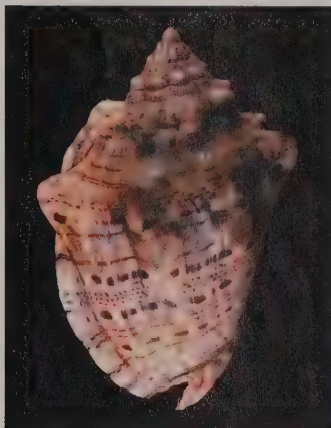
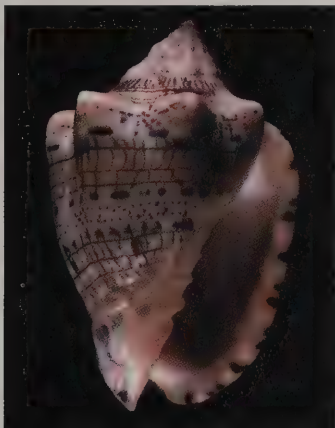
Voluta musica form *thiarella* Lamarck, 1811. 70 mm. 8', in sand, Almond Tree Bay, St. Vincent.



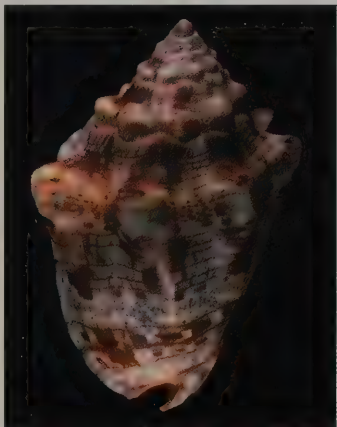
Voluta musica form *guinaica* Lamarck, 1811. 74 mm. 5', in turtle-grass, Amuay Bay, Venezuela.



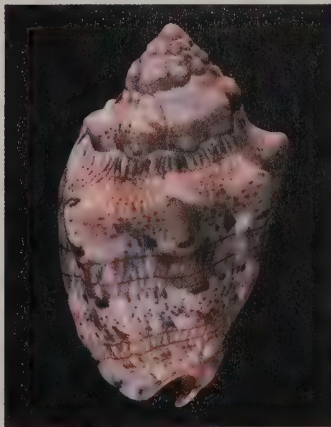
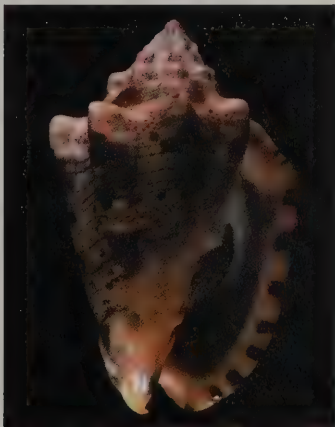
Voluta musica musica Linnaeus, 1758. 80 mm. 3' of water, in sand around reef, Tobago.



Voluta musica musica Linnaeus, 1758. 110 mm. 40', in sand, Puerto Francis, Miranda State, Venezuela.



Voluta musica musica Linnaeus, 1758. 82 mm. 70', in sand near reef, Margarita Island, Venezuela.



Voluta musica musica Linnaeus, 1758. 75 mm. 8', in sand near reef, Bonaire, Netherlands Antilles.



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Book Reviews (continued from page 23)

The Ambonese Curiosity Cabinet by Georgius Everhardus Rumphius, translated, edited, annotated, and with an introduction by E. M. Beekman. Yale University Press, New Haven and London, 1999. cxii + 567 pages. 278 x 188 mm. ISBN 0-300-07534-0. \$45.

G. E. Rumphius was one of the great naturalists of the seventeenth century, and his role as a pioneering conchologist was only part of his comprehensive work. Born in Germany in 1627, Rumpf was trained by his father in drawing and engineering, skills that enabled the young man to eke out an uncertain living as he suffered through the turbulence of the Thirty Year's War. Dutch connections led to his learning that language, and also to his being hoodwinked into an abortive military expedition to Brazil; somehow he ended up in the army in Portugal for three years, where he learned Portuguese, yet another skill that was to prove useful later on. Finally, late in 1652 the 25-year-old Rumpf signed on as a "gentleman soldier" with the Dutch East India Company, and forever left the continual chaos of Europe for the erratic tranquility of the tropics.

These scene-setting facts are recounted in a most informative introduction to the new translation of the book that established Rumphius as one of the founding fathers of conchology. E. M. Beekman, a scholar of Dutch colonial literature and a professor at the University of Massachusetts, paints the background to Rumphius' life and times in an extensive and beautifully documented discourse that precedes the presentation of the "Indian Pliny's" posthumous 1705 publication.

In the East Indies Rumpf soon found himself on the small island of Ambon—small but important as the center of clove and nutmeg production. (The island lies midway between Sulawesi and New Guinea.) With his linguistic and drafting skills, Rumpf moved from the military to the mercantile aspects of the Dutch East India Company, and by 1660 he had the second most lucrative post on the island. Meanwhile, he began to devote his evenings and other spare time to the pursuit of natural history—botany, geology, zoology. He collected natural curiosities and made drawings and notes not just about the specimens in his collection but their natural living habitat as well. As his intentions gradually formed he took on the Latin form of his name, Rumphius. His herbal was finally published in 1741, long after his death in 1702. His *Ambonese Curiosity Cabinet*, designed and entitled to capture the attention of collectors in Europe, met with a series of mishaps and was also published posthumously.

Among the disasters that overtook him was glaucoma, so that he became blind at 42. There being no one to whom he could dictate a Latin text, he was obliged to switch to Dutch, which has made the texts of his works relatively inaccessible. Another tragedy was a fire that destroyed his own drawings of the specimens. Consequently, the beautiful plates that accompany the book are not the work of Rumphius, and at least one plate contained precious cone shells that he had never seen, including a few specimens that would not have been known in his geographical area. Thus we find on plate XXXIV a handsome cone, *genuanus*, which is found in West Africa but not on Ambon. Likewise on the same plate there is a shell called "the Lion Rampant Toot" that is possibly *Conus spurca* from the West Indies.

The *D'Amboinsche Rariteitkamer* (to quote its Dutch title) consists of three parts, the first dealing with soft shellfish, the second with hard shellfish, and the third with minerals, stones, and "other rare things" including fossils. Beekman quotes from E. von Martens' 1902 analysis that a total of 339 species and 151 genera of mollusks are described in Book 2, of which 157 species and 20 genera had never been mentioned in print before. Rumphius is apparently the first to describe the molluscan radula: "and some have a sharp little bone therein, which

can hurt you, and wherewith they are apparently able to pierce something." He describes the sting of *Voluta pennata* (which the footnotes identify as *Conus textile*) as killing a slave woman almost instantly. Similarly, he describes the poisonous sting from the "little thorn" in *Mitra papalis*—a name that was subsequently adopted by Linnaeus.

It is fascinating to see which names have stuck and which have changed beyond recognition. *Voluta musicalis* is described as the "Music Whelk, or Little A.B.C. Books"—"the shell is white, but closely covered with rough, black, and square Characters, all in rows along the whorls, and somewhat resembling Music notes." *Vespertilio* "seems at first to be a Murex, because the edges of the circumvolutions are covered with sharp knobs, like the thorns of a Rosebush, but the Animal that lives within proves that it belongs to *Volutae*, because they all lack lids.... The shell is a pale white on the outside, sometimes a light red, marked with black spots and tabbied, like the wings of a bat." Tabbied? Here one of the hundreds of erudite footnotes comes to the rescue, and it's worth quoting:

The *OED* provides as the principal meaning of "tabby" a general term "for a silk tafeta, originally striped, but also applied afterward to silk of uniform colour waved or watered." To give cloth that wavy appearance, a machine, called a calendar, was used. Basically a set of heavy rollers, the machine inspired the phrase "calendered paper." And, yes, the name for the brindled gray or tawny cat comes from the original textile term.

An excellent index that includes species names enables a reader to find quickly the plate of *Cypraea argus* (for example), as well as its description. Rumphius calls it *Porcellana argus* and writes, "These too are seldom found because they sojourn deep down in the sea, and crawl in weels [a type of fish trap illustrated in the notes] sometimes, or are tossed up by earthquakes, as happened in the year 1674... the shiny ones are very rare."

So many interesting details of the shells are provided that this review could easily continue for several columns. Suffice it to say that besides these descriptions, Rumphius gives a brief account of how different kinds of shell grow, and 33 pointers on how to gather and clean shells. Altogether this is a delightful and informative book, a must for any serious conchological library. —Reviewed by Owen Gingerich,

Harvard-Smithsonian Center for Astrophysics

Bivalves at Last!

The Santa Barbara Museum of Natural History's latest scientific publication, *Bivalve Seashells of Western North America*, is finally a reality. Considering the scarcity of information readily available on bivalves and the quality of this new work, it simply has to be the book of the year! The bibliography alone is worth its price. Eleven years in the making, the monograph documents and describes all bivalve mollusks from Baja California, Mexico to northern Alaska, from the intertidal zone to depths of more than 4,500 meters. This tremendous effort was led by Dr. Eugene V. Coan and Paul Valentich Scott of the Santa Barbara Museum of Natural History, and the late Frank R. Bernard of the Pacific Biological Station in British Columbia, Canada. The authors examined bivalve specimens located in museums around the world and documented 472 species living along the Pacific coast. Most of the species are well represented in the Santa Barbara Museum's vast collection of some 2.5 million shells. It includes photographs of each species, along with a description of its shell, habitat, and ecology, and cites over 4,700 bibliographic references. The publication will be available directly from the Museum, at 2559 Puesta del Sol Road, Santa Barbara, CA 93105. For more information see the museum website at <http://www.sbnature.org/atlas/bivbook.htm>. The cost of the hardbound book is \$99 US, plus postage and handling, a reasonable price for the bibliography alone! Christmas gifts, anyone? More in December!

(Coltro article continued from page 27)

Soon Marcus started to complain about the walk and Luiz and Alfredo agreed with him. I, on the other hand, wanted to go on to the station! And to make it worse on them, I, besides being a little bit heavy—only about 120 extra kilos heavy! —I passed them and started to leave them behind. They followed me complaining but we arrived in the station. The view was fantastic. We rested a little bit and we went back to the trail. We chose the short way down, very rocky and hard to walk but it took less than one hour. It was a great day!

Next day we went to Otavalo again. The handcraft fair was much better than our first experience and we found people selling the land shell *Bulimulus quitensis* as a food! They drown the poor shell in water with salt, onion and garlic. And then they eat them raw. We bought bags of them but we didn't eat them!

On our last day in Quito Alfredo and I returned to the road to Santo Domingo de los Colorados to look for the young man and the shells. We arrived at his house and his sister told us that he hadn't arrived yet and that they were worried about him. We drove down the mountains and tried, unsuccessfully, to find him. We returned to his house at the end of the day near dark. He had come back, left the shells with his sister and gone to the school. He had found many interesting species. I paid and we started our way back to Quito.

Suddenly an extremely dense fog appeared and I couldn't see my car's front! I became very apprehensive because along the road was a huge abyss! Alfredo jumped from the car and started to walk in the front of the car showing the correct way. After three hours and just five kilometers the fog disappeared completely and we had a beautiful clear night!

We had a dinner and we packed everything for the next day. Our flight was scheduled for afternoon. We went to do some shopping

because Ecuador has very beautiful handicrafts. And after some hours we returned our car and we went to the airport.

I always like to arrive early in the airport and that day it was raining a lot. And, as usual, we were the first to arrive, at 6 p.m., three hours before the flight. We were booked for a flight with Aeroperu to Lima with a short connection to São Paulo. We had our checking-in done, paid the airport taxes and did the immigration routine. Everything was fine. We were two hours early and ready to be back home. But after one hour we were told that the flight had a 2 hour delay due to weather. After two hours they announced that the airplane had landed. I was worried about the weather and the airport. Quito's airport is one of the most dangerous in South America because it is between high mountains.

After a half hour they informed us that the flight had a new delay, another hour. And then it was one more delay. After 4 hours of waiting we saw our airplane taking off so we ran to the Aeroperu desk; they just said that the airplane couldn't take us because it was raining too much and they had enough passengers! It was our connection flight! Most of the people around us wanted to destroy the Aeroperu desk. After a while they decided to send us to local hotels and find flights for us the next day. We spent most of the next day in the Aeroperu office, but finally we got an afternoon flight to Lima on a Venezuelan airline we'd never heard of, and from there a night connection with the Brazilian airline, Varig. No harm done. BUT we had prepared all those shells for just one day's travel...and when we sent our luggage aboard we could see the flies around....

We arrived in São Paulo almost two days later, fortunately without any customs problems. Again, Ecuador left us with great memories, and shells, of course!

Next time: New Finds in Ecuador—1999

(Garcia article continued from page 6)

It was not possible to identify some *Cerithiopsis* species and a vitrinellid. They are probably un-named species.

Arene venustula, *Vexillum pulchellum*, *Conus stimpsoni* and *Conus mindanus agassizii* have never been reported from the Gulf of Mexico, including the southern Gulf; and although Sunderland (1990) reported *Conus riosi* from the Bay of Campeche, southern Gulf of Mexico, its existence there was questioned (Rosenberg, see references).

Other species of interest collected during the dredging operations were two live-collected *Chicoreus consuela* (A. H. Verrill, 1950) at two different stations; a live-collected *Haliotis pourtalesii* Dall, 1881; a live-collected *Perotrochus amabilis* (F. M. Bayer, 1963); one specimen of *Zeidora bigelowi* Pérez Farfante, 1947, a species previously reported from the northwestern Gulf but still very rare; and a dead juvenile *Charonia tritonis variegata* (Lamarck, 1816), a species that had already been reported from off Louisiana (García, 1974), but which seems not to have been found in the Gulf again until now. The earlier specimen, a slightly larger juvenile, was collected SCUBA diving in one of the pinnacles, together with a live *Conus mus* Hwass, 1792, another geographical record that has not been duplicated.

Of the live mollusca collected, the most impressive was without doubt *Haliotis pourtalesii*. A very active animal, I could feel it wiggling in my hand as I carried it to the makeshift aquarium. Once there, it remained active for nearly one hour. The animal itself is semi-translucent pale yellow, except for the base of the foot, which is creamy white; the papillae surrounding the foot are also semi-translucent pale yellow; the eyestalks are somewhat darker around the eyes, which are black. The tentacles have rings of black zig-zagged lines,

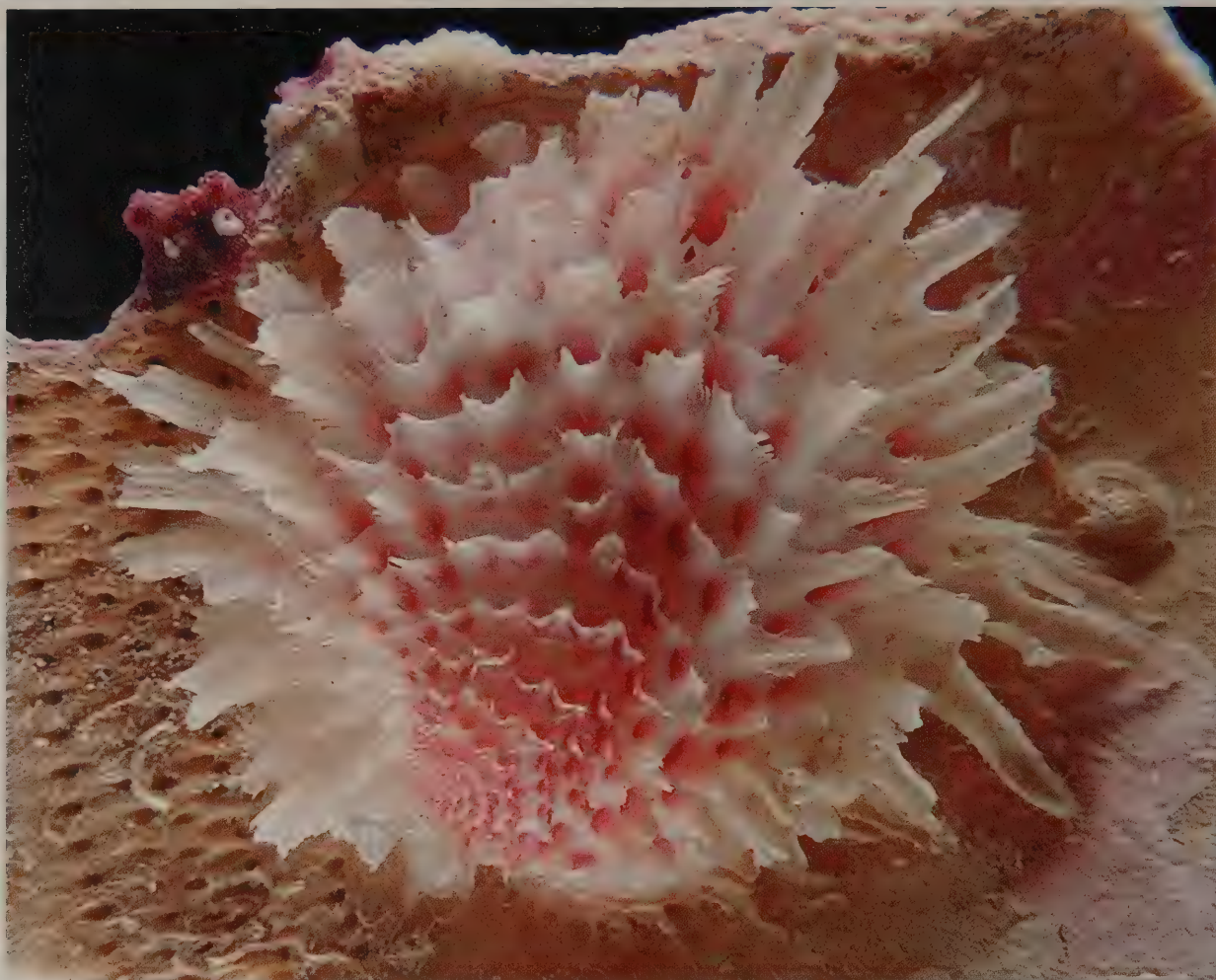
with another thin black line running almost the entire length of the top of the tentacle. The top of the foot is mottled with black and orange. Although the animal was very active, it never extended very much outside its shell.

Of the records reported in other dredging or SCUBA operations (García, 1996, 1999), *Vexillum sykesi* (Melvill, 1925), *Triptychus niveus* Mörch, 1875, and *Hemitoma emarginata* (Blainville, 1825) were collected at two stations each, reconfirming the presence of these species in the northwestern Gulf.

My deepest thanks to Dr. Darryl Felder for his invitation to join him in this expedition, which was made possible by a grant from the U.S. Department of Energy; and to Dr. Suzanne Fredericq, who gave me free use of equipment that made my identification work much easier. Dr. Harry G. Lee has my gratitude for his customary willingness to help with the identification of obscure micromollusks and the latest taxonomic nomenclature. He has also read this article and made suggestions to improve its quality.

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American CONCHOLOGIST

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In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors — to the beauty of shells, to their scientific aspects and to the collecting and preservation of mollusks. Our membership includes novices, as well as advanced collectors, scientists and shell dealers from around the country and the world.

In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological and cultural importance to humans, and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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Holidays are here and I hope all of you are planning to observe them with family or friends. After the holidays, Florida Shell Shows gear up and Donald Dan has been good enough to keep us posted on which shows are going on where. Hope some of you will plan to attend one or more of the shows

Any of you who are on Conch-L know that Bobbi Cordy has been keeping us up to date on happenings for the 2001 Convention. Sounds like lots of exciting fun is planned. Watch for more information in this issue and also in the March issue of *American Conchologist*.

Mark your calendars so that you can plan to attend the convention in July. What better way to celebrate the summer!

The Board is beginning to get their plans together for the mid year board meeting. If any member has any business he feels the board should take a look at, please feel free to get in touch with any board member. Ideas are always good to get, may just be what the board needs to answer a question they may have been looking at.

Remember to get your NEPTUNEA award suggestions in to a Board member by January 1. You may nominate any one who you feel has contributed outstanding and distinguished service to conchology and malacology. They can be for 1) Service to the organization, Conchologists of America; or 2) Service to the scientific interests of Conchologists of America; or 3) Service to the science of malacology as it applies to conchologists. Remember, each category is separate and can apply to anyone. The board will read and consider the nominees at their midyear meeting.

Again, I hope you have Melbourne and 2001 Shell Odyssey on your calendar. See you there.

Betty

COVER: New cover design by COA's photographic editor, Jim Miller. This issue's cover artist is Sara Morris Swetcharnik, a sculptor, painter and writer. Her sculpture, "Swimming Nautilus," reflects her interest in animal art. Ms. Swetcharnik's hope is that her work will not only heighten the viewer's esthetic experience, but also cultivate environmental concern. At an exhibition of her animal art at the National Zoological Park in Washington, DC a visitor looked at her bronze sculpture of a Komodo dragon yearling and commented: "I have always hated reptiles, but this has a poetic grace that helps me to appreciate and care about the animal." Sarah's husband, painter William Swetcharnik, contributed the cover paintings to the September 1992 *American Conchologist*. Inquiries about the Swetcharniks' molluscan art may be directed by email to <swetcharnik@hood.edu>. More about Sara's animal stories and art can be seen at <<http://www.marrder.com/htw/special/jungletails>>

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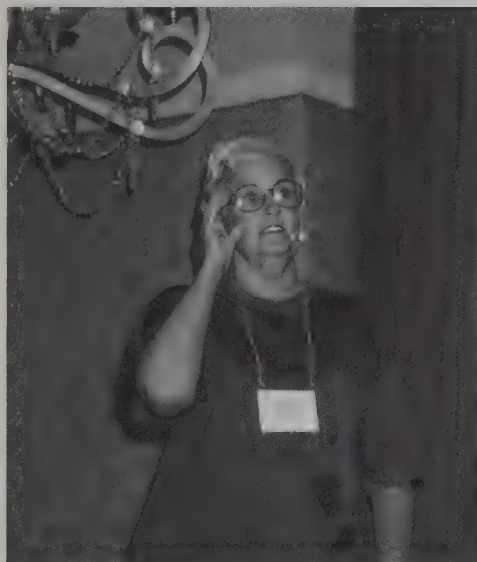
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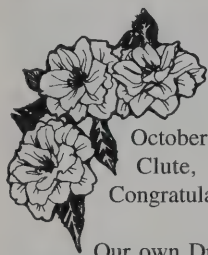
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Bobbi Cordy, "2001 Shell Odyssey" Co-Chair, describes some of the excitement in store for us at our Millennium Convention at Port Canaveral in July. *Photo editing by Jim Miller*

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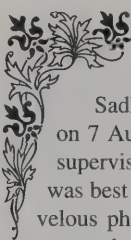
Flowers to....

The Sea Shell Searchers of Brazoria County. They held their first shell show the weekend of October 20 at the Center for the Arts and Sciences in Clute, Texas. And very successful show it was! Congratulations to all.

Our own Dr. G. Thomas Watters, who has been appointed Curator of Mollusks at the Ohio State University Museum of Biological Diversity effective in January. Tom is stepping into the position Dr. David Honor Stansbery is vacating upon his retirement. Though we regret seeing Dr. Stansbery leave, we know the fabulous freshwater collection at the Ohio State University will be in excellent hands.

The Sanibel Museum for their very large and generous donation of shells, books and magazines to the COA Convention in Houston last June. Their contributions were a large factor in the success of the Convention 2000 Auction and are greatly appreciated, as are those of all contributors! The Museum was inadvertently left off the list of convention donors in September.

Archie Jones whose wife, Margaret, passed away in late October. Archie, we are all so very sorry for your loss. Our thoughts are with you.



Bertram C. Draper

Sadly we report that Bertram (Bert) C. Draper passed away on 7 August, 2000 at age 96. Bert was a maintenance training supervisor with United Airlines until his retirement in 1969. He was best known among malacologists/conchologists for his marvelous photos of minute shells (ie. those less than 10 mm) that appeared not only in his own publications but also in those of James H. McLean, Donald R. Shasky, Crawford Cate and many others.

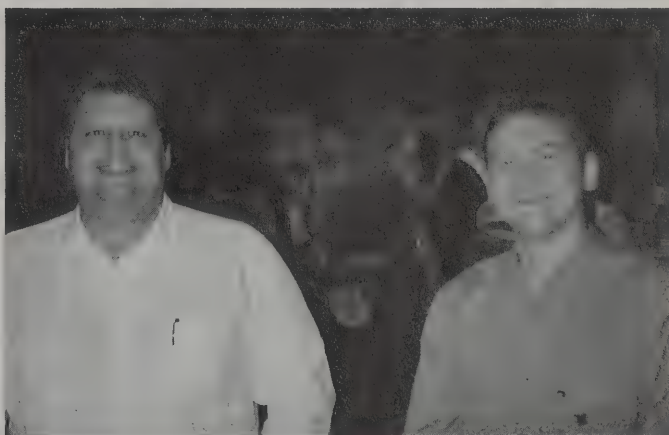
Bert became a member of the Conchological Club of Southern California in 1961 and served as CCSC secretary in 1964 and 1965, treasurer in 1966, vice-president in 1971 and 1984, and was president in 1972, 1973, and again in 1985. He was active in the club through 1999 and was a mainstay for giving top-notch presentations that featured his minute mollusk photography. Bert was appointed Museum Associate in Malacology in 1973 in recognition of his publications and service as a volunteer. He was also a member of the Western Society of Malacologists, the San Diego Shell Club, the Hawaiian Malacological Society, and the Pacific Shell Club. He was editor of the self-prepared and published *Lost Operculum Club*, a guide of record size shells of the Eastern Pacific, from 1966 through its final edition in 1987.

Bert always referred to himself as an amateur malacologist and his publication record reflects his dedicated interest in shells. In particular he had a passion to photograph and identify the difficult minute families of Triphoridae, Caecidae, and Vitrinellidae, especially those of the eastern Pacific and Hawaii. In addition to his love of minute shells, Bert enjoyed stamp collecting, trains (both full-size and model railroads), photography, and the music of Lawrence Welk. Bert happily shared his knowledge with colleagues and friends, and we will certainly miss his colorful descriptions of observing live caecids from tide pools, flying over Mauna Loa during an eruption, or collecting fossils from the Miocene Topanga Formation. He will indeed be missed.

—Lindsey Groves

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On the COA Convention Registration form for the 2001 Shell Odyssey, Doris Underwood's phone number is incorrectly shown. Her correct phone number is (321) 724-2449.



Jose and Marcus Coltro are shell dealers (Femorale) from Brazil. Jose is COA's Publicity Director, recruiting new COA members worldwide. Marcus is a proud new father. They are also frequent contributors to *American Conchologist*. *Photo editing by Jim Miller*

ISLAND HOPPING FOR LAND SNAILS OFF ISTANBUL

by Aydin Örstan

Photos by the author

Photo editing by Jim Miller

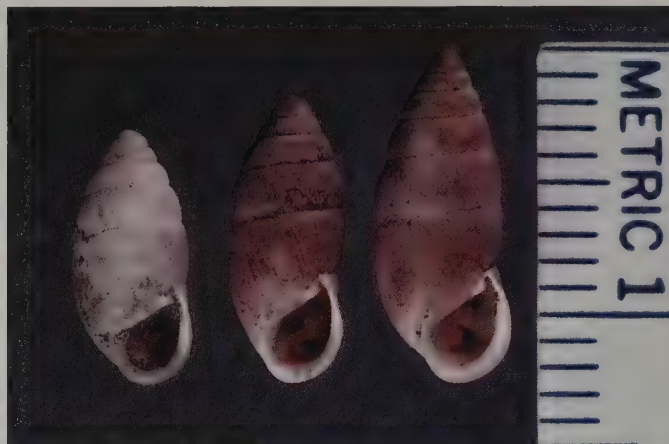
19th century Istanbul, the exotic capital of the Ottoman Empire under its alias, Constantinople, appears to have been a favorite destination for land snail collectors. Many of the European malacologists of that era, Pfeiffer, Mousson and Retowski among them, published lists of species from Istanbul and the many villages surrounding the city with their pastures, orchards and woods. In Schütt's 1996 compilation of the land snails of Turkey, I count 8 species whose type location was Istanbul or its vicinity. Unfortunately, the relentless expansion of the city has long covered its once rural environs with concrete and obliterated many of the original habitats.



Left, *Euxina hetaera* (length, 13.9 mm) from Büyükkada and *Bulgarica thessalonica* from Heybeliada.

In the Spring of 2000, while planning for a summer expedition to Turkey, I set aside a few days to find out how many of the species described from Istanbul I could still collect there. Because I didn't have time for an extensive survey of the city, I decided to concentrate on the largest three islands of the group of nine that lie a few kilometers off the mainland in the Sea of Marmara. The Istanbulites refer to them as *Adalar*, meaning simply the Islands. The Europeans have known them as the Prince (or Princes') Islands, apparently because the Byzantine, who ruled the area until 1453, exiled to these islands the members of the royal family who had fallen out of favor (for a 2000-year history of the city as well as a tour guide, see Freely, 1998). Although the islands have probably been inhabited for as long as humans have lived in the area, they have so far been spared the largely uncontrolled building frenzy that has consumed most of the land around the mainland city. The three largest islands still have a few hills covered with pine forests, dotted here and there by old churches, monasteries and cemeteries. I hoped that perhaps on those hills and around the old buildings I would find some of the original inhabitants.

On 1 August 2000, I started my quest on Büyükkada (the largest 13348 Cloverdale Place, Germantown, MD 20874 E-mail: bdelloid1@aol.com



Size range of *Mastus carneolus* shells (lengths, 9.3 to 12.2 mm) from a station on Büyükkada.

island, referred to as Prinkipo in the European literature). There, Teri Varnali, a friend from my college days in Istanbul, joined me. Teri had never collected land snails before, but she quickly became an enthusiastic and diligent searcher. One of our first stops was an old Greek monastery surrounded by a high wall facing a pine forest. Along the bottom of the wall under the dry pine needles, we found our first specimens of the clausiliid *Euxina hetaera*. Pfeiffer described this species in 1848 with specimens from the same island. It was gratifying to find out that the species was still there and doing seemingly well after more than 150 years. There was another clausiliid, *Bulgarica thessalonica* Rossmässler, 1839, whose type location, implied by its name, is Thessalonika in Greece. It had been first recorded (as *Clausilia spreata*) from Büyükkada by Küster in 1861. We also found *Mastus carneolus*, described by Mousson in 1863 from the "environs of Constantinople."

As we were busily searching for shells, we heard a woman greeting us from the top of the wall. After I explained to her what we were after, the woman became friendly and talkative. She told us how they prepared and ate the snails. When I lifted up a large dormant *Helix lucorum* for her to see, she excitedly declared that that was one of the kinds they were fond of eating. As we were getting ready to leave, she told us to wait and disappeared behind the wall. When she returned a few minutes later, she threw down, wrapped in newspaper, a small packet of shells she had collected for us in the garden of the monastery. Later, among those, I found three shells of *Eobania vermiculata*, which I am sure our collector in the monastery is also fond of eating.



Helix lucorum (diameter, 48 mm) after a mid-day rain shower on Büyükkada.

A short time later, we were on our way to the top of the highest peak (200 m) on the island when the sky started to darken. By the time we reached the summit a downpour had started. We had no choice but to take refuge in the old and locally famous Greek Church of Aya Yorgi (what the Turks call the Greek name Haghios Yorgos, meaning Saint George) at the summit. The church itself was locked, but we found a couple of chairs in the vestibule, sat down and spent half an hour chatting.

After the rain stopped we resumed our search for snails. The hill was rocky and the church was surrounded by an old wall, but to our disappointment, there was not a shell to be found in the vicinity. However, back down the hill near an old wall of loose rocks, we encountered several large *Helix lucorum* that had been awakened by the rain. They were crawling on pine needles. This gave me a chance to photograph them alive in their natural surroundings. These large edible snails are native to these areas.

After a lunch break at an outdoor restaurant, where the food was mediocre but the cats were friendly, we went back to work. Soon we were searching for shells in the Greek cemetery. There, besides more *Helix lucorum*, we saw one live *Helix aspersa*, whose ancestors may have been brought to the island by the snail-eaters a long time ago.

Later that afternoon, I looked for snails in the garden of Teri's house on the island. The species I had encountered elsewhere on the island were curiously absent and what I instead found was quite familiar: *Vallonia pulchella*, the most common species in the backyard of my house in Maryland!

The next day, I collected alone. Early in the morning I took a ferry to the third largest island Burgazada (Chalki or Halki of the older literature, derived from the Greek word for copper in reference to the copper mines that once existed on the island). The Turkish name, a distant relative of the European *burg*, refers to the small fort that once existed on the island. After wandering for some time in the maze of streets and asking for directions several times, I

managed to locate the dirt road that went up through a serene pine forest to the top of the highest hill on the island. There I found another ancient Greek church surrounded by a low wall of loose rocks. At that hour, the only sign of life in the churchyard was a lone donkey, who, after seeing me approach the wall, quickly disappeared behind the keeper's house. There were many loose rocks on the ground along the wall. Under those I found more *Euxina hetaera*.

Not too far from the church, at the edge of the woods I came upon a spot where the ground was covered by collapsed walls, bricks and other debris. This appeared to be what was left of the restaurant shown at this location on an old map I had. As desolate as it was, it turned out to be a great collecting spot, for shells were abundant under the rubble. I stayed there for about an hour and found many shells of *Euxina hetaera*, *Pleurodiscus balmei* and what I tentatively identified as



Dormant *Helix lucorum* under the rubble at the ruins of the restaurant on Burgazada.

Oxychilus camelinus. A soil sample, after sieving and sorting, produced many microshells, including *Truncatellina cylindrica*, *Pupilla muscorum* and a *Vitrea* sp.

In the afternoon, I took the ferry to the second largest island, Heybeliada. From a distance, the two hills of this island are said to look like a *heybe*, a bag with two compartments placed over the back of a donkey or a mule. Hence, the name, which means the island with the heybe. There, I found the Moslem cemetery located on a hillside outside the town. Perhaps because of the stifling afternoon heat, there was no one around, not even the keeper of the cemetery, to notice a rather suspicious person who would have appeared to be digging(!) around the graves and when questioned, would have defended himself with the outlandish claim that he was only looking for snail shells. Without distractions, I spent a long time looking for and collecting shells. The cemetery was not well kept. The ground was covered with pine needles and other plant material; grasses had grown right against the cracked walls around some of the older graves. Other visitors may have scoffed at these conditions, but I realized they created a good habitat for snails. Under the pine needles around one grave dating to the early decades of the 20th century, I hit the jackpot! There were many *Euxina*, *Bulgarica* and *Mastus* shells. The *Mastus* species that lives on these islands is supposed to be a subspecies, *M. carneolus subcarneolus*, that Bourguignat described in 1876 with specimens from



The old Greek church (behind the trees) near the summit on Burgazada. The wall of loose rocks around the churchyard is a typical example of the walls still built in rural areas of Turkey.



Shells were abundant under the pine needles around the old graves in the Moslem cemetery on Heybeliada. The fenced in grave is probably from before 1928 when the use of the Arabic script in Turkey ended.

Heybeliada. It is distinguished from the "typical" *M. carneolus carneolus* by being smaller than about 11 mm in length. However, the continuous height distribution of the specimens at some locations, for example, Büyükada, suggests that around Istanbul there is but one taxon.

Twelve days later, back from an expedition to southwestern Turkey, on my last full day in Istanbul, I got together with Teri again and went back to Heybeliada. We walked up to the ruin of an old mill on a hilltop. There were no surprises at the mill, but more shells of *B. thessalonica* and a *Monacha* sp., that we had previously found on Büyükada. However, going down the other side of the hill, we surprised a couple of *Homo sapiens* sweethearts who hadn't figured that snail hunters could be coming their way in the otherwise deserted pine forest. Further down the hill, we chanced upon an even more interesting sight: there were dormant *B. thessalonica* under the small rocks

dotting the gentle slope covered with pine needles. Loosjes (1963) noted that *B. thessalonica* lived under stones also in Macedonia, Greece. This is probably the original microhabitat of this species and, possibly of *Euxina hetaera*. It appears that after the humans came and started building mills and walls, the snails got transported on the rocks and took up residence near human occupations. As long as the pine forests, the old walls of loose rocks and the unkempt cemeteries are left alone, the snails will be safe.

After returning home, I noticed that we hadn't encountered one species, *Chondrula orientalis*, that Pfeiffer described in 1848 with specimens from Büyükada. We certainly couldn't have missed it, for it is about as large as the clausiliids we found. I am hoping that it still lives on one of the islands, perhaps in a unique microhabitat that we overlooked. I sure will not mind taking another trip to Adalar to look for it.



Yours truly on Heybeliada with the mostly wooded hills of the island in the background.



Teri is searching for shells near the ruin of the mill on Heybeliada

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Figures 1 and 2: *Fusinus josei* Hadorn and Rogers, 2000: 101.7 mm., dredged at approximately 400 m. In Florida Straits (Coll. B. Rogers).

Recently located specimens of *Fusinus josei* and *Fusinus harveyi*

by Bud Rogers and Roland Hadorn

Photos by the authors,
 Photo editing by Ross Gundersen

Exploratory fishing vessels *Oregon*, *Combat*, *Pelican* and *Silver Bay* logged some 6,300 stations during 112 cruises in the period 1950 to 1965 as they inventoried the fishing resources of the tropical western Atlantic. The shells of uncommon and rare *Fusinus* which were taken as a result of this program were the bases of our recently published paper. "Revision of Recent *Fusinus* (Gastropoda: Fasciolaridae) from Tropical Western Atlantic, with description

of six new species," by the authors, is in *Argonauta XIV* (1): 5-57, published in May 2000.

In 37 pages and 16 color plates with 144 figures, all available name-bearing types are figured. Several lectotypes are selected to clarify some taxa. The taxonomy for each known species of tropical western Atlantic *Fusinus* is reviewed and compared with that of similar taxa.

After publication, one specimen of *Fusinus josei* Hadorn and Rogers, 2000 (Figures 1 and 2) and one specimen of *Fusinus harveyi* Hadorn and Rogers, 2000 (Figures 3 and 4) were obtained, both also originally collected during the 1960's by the cited Exploratory Fishing Vessels. Both of these very rare species were previously known only by two specimens each (holotypes in USNM and paratypes in Coll. R. Hadorn). We felt we must avail ourselves of this opportunity to show both outstanding specimens to readers of *American Conchologist*.



Figures 3 and 4: *Fusinus harveyi* Hadorn and Rogers, 2000: 51.8 mm., 3290403 m. Off Barranquilla, Colombia (Coll. B. Rogers).

A RARE PAIR

by Emilio García

Photo Editing by Jim Miller

A few years ago Mr. Bill Clendenin of Sarasota, Florida sent me a beautiful *Voluta roadnightae* from Australia as a present. Bill had traveled in that wonderful country and, while visiting his friend Peter Weiser, he had mentioned to Peter my interest in volutes. Peter was interested in trading and, at the time, I had very interesting material from Central America.

When I wrote to Peter concerning a trade, I told him that cones and cowries did not excite me very much, and that I would prefer unusual species from less popular families. During that time he had contacts with many of the fishing boats that worked the southeastern waters of Australia as well as Tasmania, so he provided me with a list of seldom-offered species. One of them was *Sassia epitrema* (Tenison-Wood, 1877).



Sassia epitrema

I am a general collector and, although now and then I have concentrated my interests on certain groups, I prefer to tackle the small problems that appear before me as I curate my collection. Therefore, all I knew about *Sassia epitrema* when Peter offered it was that I did not have it in my collection. I had never even seen a picture of one. However, once I had it, I asked Betty Jean Piech, the well-known ranellid enthusiast, to tell me what she knew about the species. Well, I got an earful. Such an excited reply have I seldom received.

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It seems that *S. epitrema* is one of the rarest of the Ranellidae, and that the very few known specimens were dead collected and are not in very good shape. The live-collected specimen Peter sent to me is gem quality, with operculum. It measures 24.6 mm and was dredged in only 28 ft. of water off King Island, Tasmania, in 1994. I have had the specimen for several years. When I visited Peter in Australia last year, he told me he is no longer in contact with the fishing boats.

The second specimen of this duo is also rather exciting: a beautiful, undescribed *Latiaxis* s.l. dredged in 350 m off northern New Caledonia. I "found" it at the last COA Convention in Houston while leisurely browsing through the material at the Caledonian Seashells table. One of two specimens, it seems subadult, measuring 23.7 mm in length and 35.7 mm in width, including spines. The second, a larger, gerontic specimen, was bought soon after. According to information given to me, other specimens are housed at the Paris Museum of Natural History and await description.



Undescribed *Latiaxis* s.l. species.

Australian National Shell Show

The Malacological Society of Australasia (Queensland Branch) is pleased to announce that the 4th Australian National Shell Show will be hosted in Brisbane, Australia on 23-24 March 2002. The show will cater to all levels of collectors of most classes of Molluscs, and trading tables for dealers will be available at the venue.

Entry forms, show rules, and other information will be available in late 2001. To register your interest and be included on the mailing list, please E-mail Callum Woodward at <callum.woodward@transport.qld.gov.au>

The Australian National Shell Shows are becoming an internationally recognised event. Held every second year, the show is hosted by a different club each time. The third national shell show, which was held this past March in Adelaide, attracted quite a good shelling crowd, and shell dealers from all continents attended.

Brisbane has a very active shell club, and this coming shell show promises to be a great event. So why not plan your Australian holiday now and visit the show? March is a pretty good month for travelling in either southern Australia or northern Australia.

— Patty Jansen

CONCHOLOGICAL BOOKS: A bookseller's perspective, Part 2

By Tony Swann

Illustrated with photos by S. Peter Dance

Photo Editing by Ross Gundersen

The concluding part of a talk given by Tony Swann of Wheldon & Wesley Ltd, England's most esteemed sellers of natural history books, to the Conchological Society at the Natural History Museum 18th January 1992. Part 1 was featured in the September 2000 American Conchologist.

Thinking of the major collections of shell books I have seen in my 18 years with Wheldon's, I have to confess there have been remarkably few. My first experience of a really big shell library in 1987 was also one of my biggest disappointments: the collection of the late Juan Gavala who lived near Cadiz. I flew down to Seville and met his daughter who turned out to be a most charming and vivacious lady lawyer. She and her husband drove me down to a small town near Cadiz where Gavala had lived and I there discovered one of the most fabulous mollusca libraries you could hope to see. There was an imperfect copy of Poli we had sold him in 1964, a beautiful, clean, complete copy of Martyn in red, straight grain morocco, numerous works by Hidalgo, Dautzenberg, Sowerby and others. I spent a delightful day working through books and, the following day in my hotel back in Seville, I finalised prices and prepared the formal offer. It was one of those happily fairly common cases where the customer became a friend and there was complete trust on both sides. When I presented her with the offer she said, "That is double what Sotheby's told me they could get for the books," and she accepted it. I already knew we would have to prepare fairly involved customs' documentation but it then emerged that the government had the right to step in and buy any national treasures at the price a foreign dealer was offering for them. I crossed my fingers and hoped the government would not realise that this collection certainly amounted to a national treasure. You can imagine my disappointment when a few weeks later Senora Gavala wrote to me saying the government had decided to purchase the entire library and that it would probably go, if I remember correctly, to a museum in Cadiz. If ever any of you are on holiday down there I would recommend you try and locate it, because I can assure you this was as fine a collection of shell books as you are ever likely to see.

We do not have problems just with Spain. The bureaucracy in France and Italy often makes trade in old books difficult. In spite of this we do a fair amount of business with France. I speak French, love the country and go there often, but it is a very awkward place to do business and that will not change with the "Common Market," even though the last major specialist in natural history in Paris, Library Rousseau Girard, has just closed.

The best collection of shell books we have offered in my time was very recently, in our catalogue 193 of April '93 and included items such as Born, Buonanni, Gualtieri, Hirase, a set of the *Journal de Conchyliologie*, Rumpf and Tryon & Pilsbry's *Manual of Conchology*, all of which we sold rapidly. Not only do we now export 67% of our turnover; very many of our major purchases are from abroad—we could not survive for a moment on the British market alone. A visit to a natural history museum in California led to a useful purchase of some of their duplicates and enhanced the mollusca section to which I refer, the bulk of which came from Australia. You can see how fortunate I am, loving books and greatly enjoying travel. I have even visited Hawaii on business twice in recent years.

I wish I could tell you more about large collections I have seen or bought, but they do not exist. It is very bad for any market when the collectibles are so scarce that forming a major collection in one lifetime is extremely difficult. People tend to lose interest if they cannot find the material to build their collections. I can think of serious collectors in places as far apart as Germany, Portugal and South Africa who have plenty of money and regularly send wants lists but we cannot find the books for them.

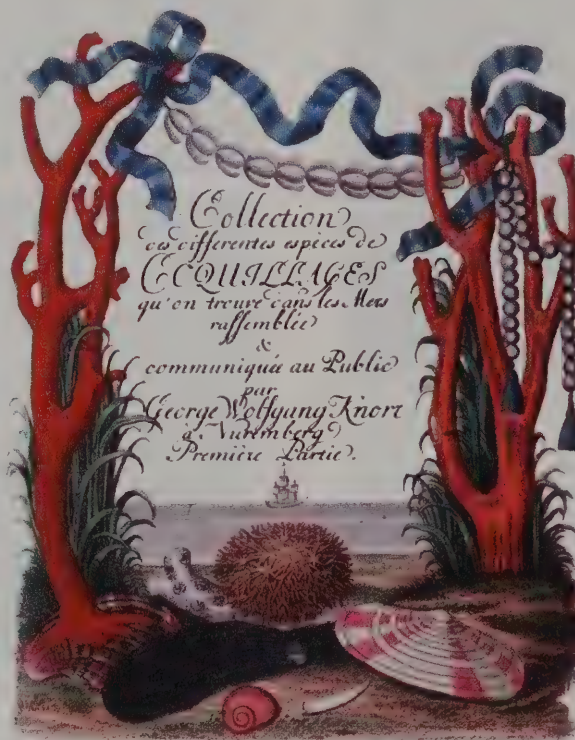
Perhaps it would be appropriate to run through some of the major books likely to appear on the market and comment on prices and availability, as well as relative importance from a bookseller's point of view. I am making the assumption that most of you are bibliophiles and would like to possess a significant library yourselves one day.

We start, naturally, with Aristotle who left us a remarkable history of Cephalopods and by his own researches was able to characterise several groups of Testacea. Obviously he has gone through innumerable editions over the last 500 years and is still in print.

Moving to Rome we have Pliny's great encyclopaedia which Johnston, in his *Introduction to Conchology* 1850, says largely anticipated the taste and credulity of his age, and that to conchology as a science he has added nothing which Aristotle did not supply, although he furnished some anecdotes for a chapter on its economical applications. We have in stock a copy of the English translation by P. Holland, two volumes, folio, 1601. There is also a very popular edition in

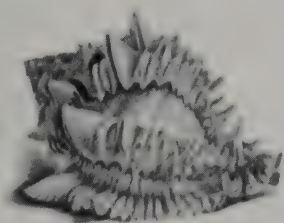
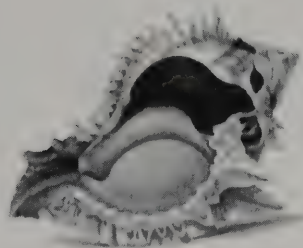
6 volumes by the publisher Bohn 1855-57.

By the 16th century, barely 100 years after the invention of printing in Europe, we see massive volumes published by Belon, Rondelet, Gesner and Aldrovandus between 1551 and 1599. Most of these enormous, sometimes credulous compilations contain sections on conchology; their scientific importance is in no small part due to the illustrations of many of the species mentioned.



Title page to Part 1 (1764) of G. W. Knorr's
Les Delices des Yeux et l'Esprit.

Johnston devotes some space to Fabius Columna, mentioning his two works dated 1616, "De Aquatilibus" and "De Purpurea," the latter containing his genuinely scientific researches into Tyrian purple, with good woodcuts. We had this book in 1989 at £225, and we do still handle many other 16th and 17th century books.



Murex regius, Swainson's *Exotic Conchology*, 1821. Photo by S. P

A great stimulus to the production of fine shell books was the rise of museums linked to commercial interest in beautiful shells, the museum said to have originated with Aldrovandus. It is from this institution of museums that we date the origin of conchology as a separate branch of natural history, their catalogues being of some historical significance (that of the Duchess of Portland of 1786 comes to mind) and the love of making collections of shells leading directly to Buonnani and Lister, whose works are the first exclusively devoted to shells.

Buonnani was a Jesuit whose book—*Recreatio Mentis et Oculi* 1681—demonstrates talents

which, though respectable, do not raise him above the level of his age. One should not denigrate him too much as many of his illustrations were referred to by Linnaeus. We had a good copy of this work for £1,000 last year, a reasonable price in view of the fact that the bibliographer Cobres noted it as "ein seltenes Buch" in 1782.

According to Johnston, on the other hand, Lister was "a true naturalist, and the first conchologist of decided eminence." We had the 1770 edition of his *History of Shells* at £1,500 in catalogue 193. Turton described it as an admirable volume, the labour of many years, with the 1,084 engravings all drawn from original specimens by his daughter Susanna and his wife Anna. Certainly this work is a great landmark in the advance of conchology. The original edition produced between 1685 and 1692 is now very rare.

By the time of publication of Rumpf's *Amboinsche Rariteitskammer* in Amsterdam in 1705, a remarkable flood of shells was entering the museums, or what one might more properly call the private cabinets, of Europe, particularly in Holland. While you will all have heard of tulipomania, there was, particularly in Holland but also in England and France, something of a speculative bubble in shells as well and extraordinary sums were paid for rare specimens. Happily that encouraged the production of fine books on the subject. A particularly good example of luxury shell book production is Born's *Testacea Musei Caesarei Vindobonensis*, Vienna 1780, which Maria Theresa instructed Born to produce on the imperial collection of shells. It is a folio with 18 fine coloured plates and we sold a copy last year for £1,750. How things have changed since, as I mentioned earlier, we sold the finest possible copy for £15 in 1947.

I must not omit to mention Adanson's book published in Paris in 1757, *Histoire naturelle du Senegal: Coquillages*. Tryon, writing in 1880 in his *Manual of Conchology*, went so far as to say, "Adanson must be regarded as the founder of Malacology." It is a handsome 4to

volume with 19 engraved plates and we sold one for £475 two years ago.

Moving on, Johnston mentions Knorr, Martini & Chemnitz, Pennant, da Costa and Martyn and rather scathingly comments on many books as merely the labours of iconographers and collectors, of little significance to his history. Some of them, however, are of great interest to the bookseller and book collector and very beautiful.

I have to say that the great pleasure I derive from handling books is an aesthetic one and also even a physical one. The feel of a fine old binding which houses paper of the highest quality, beautifully typeset, and fine woodcuts, engravings or hand-coloured lithographs, gives me a real thrill and a sense of privilege in that most people have to be relatively wealthy to enjoy such pleasure. This is something that adds immeasurably to the quality of my life as I live very modestly, but daily can walk into our showroom and enjoy contact with objects of real beauty. I am sure Johnston would have scorned my lack of a scientific background, but my simple enthusiasm for fine illustrated books is useful in that it is the illustrations which tend most of all to make the book valuable and saleable these days. Regrettably I do not have the time to go into detail on the various techniques of book illustration over the centuries. May I suggest you consult Peter Dance's "Classic Natural History Prints: Shells"? I have brought along the finest old shell book we have in stock at present which will enable you to share briefly some of the pleasure I have been talking about. This is Perry's "Conchology" of 1811. It is, however, a book that has been subject to violent criticism. The illustrations are so inaccurate that Sowerby suggested Perry had only seen them in his dreams. The text has been equally criticised for the new names introduced such as "*Cypraea camelopardalis*" [sic] of which Reeve wrote: "I consider the 'Cameleopard' of Perry should no more enter the nomenclature of

LES DELICES
DES YEUX ET DE L'ESPRIT,
OU
COLLECTION GENERALE
DES
DIFFERENTES ESPECES
DE
COQUILLAGES
QUE LA MER RENFERME,
COMMUNIQUEE
AU PUBLIC
PAR
LES HERITIERS
ET
GEORGE WOLFFGANG KNORR.
A
NUREMBERG
II. PARTIE.

1765.

Title page of part 2, George W. Knorr's *Les Delices des Yeux et de l'Espir*, 1765.

zoology than the 'Red Lion of Brentford.' " However, Perry's name is now accepted in place of the "*Cypraea melanostoma*" of Sowerby which Reeve preferred.

Perhaps the most beautiful of all illustrations of shells are in the *Choix des Coquillages* of Regenfuss (Copenhagen, 1758) with its 12 large folio coloured plates. This is a book which I have not yet had the opportunity to buy. In 1935 my uncle Charles who was then in charge of the business, had a probably unique copy with an additional 12 coloured plates prepared for a second volume. He sold it for £10 to the late Sacheverell Sitwell who, as my uncle remarked rather bitterly, took nearly a year to pay for it. In 1956 it was sold at Sotheby's for £160 and today would fetch several thousand pounds.

Talking of fine collectors' items brings to mind Martyn's *Universal Conchologist* of 1784-90. The first two volumes are the most significant because they figure shells from Cook's voyages. They do still come on the market and I have heard of these two volumes changing hands for £6,600 recently. The stipple-engraved hand coloured plates are the most beautiful representations of shells that I have seen. I cannot resist quoting Henry Chaney of the Santa Barbara Natural History Museum on his experience with the copy of Martyn we sold to Irene McCulloch in 1947 which had an extra volume of proofs and drawings with it. He says "This copy then disappeared from view for exactly 40 years. I found the 'five' volumes, wrapped in a newspaper dated 1948, when I was clearing out her office the week after her death. It was an amazing thrill similar to finding the coloured Poli in her house buried under an old carpet, covered with a thick layer of dust and sandwiched between the Atlas from the *Bonite* (voyage) and a superb copy of Knorr's *Deliciae Naturae*. I was so undone at the time I immediately removed them from her house, fearing that the structure would burn down before I could return the next morning."

You will understand from the way I referred earlier to Poli that his work is one of the great rarities in the field, keenly sought after by collectors. It is "*Testacea utriusque Siciliae*," 3 volumes 1791-1826, the third volume published posthumously. Produced by the Neapolitan physician Poli in an expensive manner, it consequently had a very limited circulation. I would not like to commit myself to stating the very large sum of money you might now have to pay for one of the very rare coloured copies.

Another extraordinary item which I have only bought and sold once in my time is Say's *American Conchology* published in 7 parts in New Harmony, Indiana, 1830-35. It was described by H. E. Wheeler in *Nautilus* in 1937 as "one of the great rarities of American scientific literature." Our records show we sold a copy to the famous collector Sykes in 1899 for £21/6- and only 3 other copies since then. I like to say, "If you're looking for some-

thing in the field of natural history we'll find it for you eventually," but I would not be optimistic about finding another copy of Say in my lifetime.

Thinking of large sums of money I will jump right into the 19th Century with Reeve's *Conchologia Iconica* 1843-78. This is surely the most important illustrated work on shells with 2,727 hand coloured plates of over 20,000 figures. Recently we were asked to value a copy a customer wished to donate to an institution. We put £20,000 on it and both parties agreed this was fair. A copy fetched £16,900 in England at auction in 1988 and the London bookseller who bought it (now no longer dealing in natural history) catalogued it at £44,000. Of course he could not sell it at that price and it has passed to a continental dealer.

It is always most inadvisable to assume ignorance on the part of your customer. Very frequently my clients know at least as much about the books in their narrow field of specialisation as I do and I am always ready to admit when I need to check with our reference system for a price or bibliographical detail. It is far better to do that than to take a risk on a price and possibly appear dishonest. In many cases, even when I have a fair idea of prices, I check before offering.

I could have prepared another hour's talk on the works of Donovan, Sowerby, Turton, Brown, Wood and Hanley, let alone Gualtieri, Knorr, Kiener, Tryon, or Martini & Chemnitz. Perhaps some other time. As I am near the end I will conclude with a few general comments on the state of the market and on our business in particular.

What I have tried to demonstrate is that, while the supply of shell books is extremely limited..., we are sometimes able to offer a selection of the great books in the field at reasonable prices. When I first joined the business we went regularly to the London auctions and came back with van loads of good books. Now, instead of an enormous room full of all sorts of books, when one goes to a London auction it is usually the same limited number of quartos and folios which come up time and again with very few shell books among them. We hardly go to auctions now and rely mostly on the families of private clients selling back to us, on disposals of duplicates from institutions, and to some extent on general booksellers. As you can imagine, anything special tends to sell very rapidly, often even before the catalogue is published. I would urge you, if there is anything you are particularly looking for, to write to me in anticipation of us buying a collection

in your field. Please note you are always most welcome at Church Square even though we have little in the way of shell books at present...

A joy of this business: you never know when a letter is going to arrive, possibly taking you thousands of miles across the world and leading perhaps to the purchase of a major collection which will delight our customers from here to Tokyo.



Plate 2 from the *Pecten* monograph in Reeve's *Conchologia Iconica*.

BOOK REVIEWS

Bivalve Seashells of Western North America, Marine Bivalve Mollusks from Arctic Alaska to Baja California by Eugene V. Coan, Paul Valentich Scott and Frank R. Bernard. Santa Barbara Museum of Natural History Monograph Number 2. Santa Barbara Museum of Natural History, Santa Barbara, CA. March 2000. 764 (+ vii) pp. 124 b/w plates. Numerous photos and line drawings. 9.5" x 11.5". Hard cover Perfect Binding. ISBN 0-936494-30-1. \$90. Available from the museum, 2559 Puesta del Sol Road, Santa Barbara CA 93105-2936.

Shelling America has just gotten easier by a west-coast mile! Any collector who has worked with the marine mollusks of the western United States is bound to have experienced frustration over the lack of a comprehensive guide to the shells of that region. A. Myra Keen's *Sea Shells of Tropical West America* has long been the bible of the southern portion of that coast, but mollusks from the northern part have remained a mystery to many shellers.

Much of that mystery is about to be cleared away by a landmark new book authored by Eugene Coan, Paul Valentich Scott and the late Frank R. Bernard and published by the Santa Barbara Museum of Natural History. It's heftily entitled, *Bivalve Seashells of Western North America, Marine Bivalve Mollusks from Arctic Alaska to Baja California* and, indeed, it's a hefty volume; measuring 9.5" X 11.5" and carrying vii + 764 pages. It weighs a lot, much more, in fact, than is a comfortable weight on one's lap while armchair browsing. It's not an armchair book at all; it's a working book, a treasure house of facts about bivalves and west coast shelling.

It is also a very beautiful book. The cover's dressed in the delicate, blurry, iridescent grays and blues and greens of an oyster shell. Its indistinct softness and the light green endpapers ornamented with Keri-Ann Platner's drawings of bivalve interiors are the only color to intrude on the simplicity of the interior. All photos are in black and white." What!" You say? "No color?" That's right, no color. As well as making the book prohibitively expensive for collectors, color would have changed the nature of the reader's view of these bivalves. Patricia S. Sadeghian's digital imaging of the 124 photographic plates and her abundant inter-textual photo illustrations are tributes to the power of fine black-and-white photography and scanning electronmicrography. Features and textures that are often lost to the viewer of color photography fairly pop out of these black and white plates. Muscle scars, pallial lines and details of periostracum are clearly illustrated without the distraction of color. And where we may need further clarification of features, pleasing, expert line drawings from many sources are provided.

The book's design and layout, by Marie G. Murphy, is always spacious and pleasing, and the pages are a delight to turn. Indeed, some wit has been devoted to choosing the mood-setting, sometimes humorous and always apt quotations that are scattered sparingly through the text. They lift the mind from the esoteric intricacies of lunules, condyles and ctenoliums to the thoughts of E.M. da Costa writing in 1778: "A cabinet of shells is a volume of fine wrote sermons"; or the Memoirs of Casanova (1725-1798): "I also had the misfortune of meeting here a very learned man of a very wearisome kind; he knew the names of ten thousand shells by heart, and I was obliged to listen to him for two hours, although I was totally ignorant of his science."

Frank R. Bernard began this work in 1965 at the suggestion of Dr. James H. McLean as a companion to Myra Keen's book, but he had not quite completed his second draft of the book when in January, 1989, he became too ill to continue with this huge undertaking. He then recruited Gene Coan to complete the task and see the book

through to publication. Dr. Coan then asked Paul Valentich Scott to help. Bernard died March 29 of that year, having left this final project of a short but very productive life in such capable hands. The book was completed in March, 2000. It treats the Bivalvia of the Northeast Pacific Ocean, from northern Alaska, through the Bering Straits and the Aleutian Islands southeast to the Isla Cedros, Baja, California (the Californian, Oregonian and Arctic faunal provinces) and includes some deep sea species and material from the northwest American Pleistocene.

Leaving generic and higher taxa mostly as Bernard wrote it, Coan and Scott, aided by workers in various of the bivalve groups, made extensive revisions of the species-level text, a task that consumed them for the next ten years. They have, say the authors, "attempted to raise questions in a deliberate effort to challenge malacologists—both professional and amateur—to address them." A section of the introduction provides a long list of problem groups in need of modern analysis.

A 35-page introduction includes an extensive and very informative section on all aspects of bivalve anatomy and another on the bivalve shell. Bivalve mollusks have long been exploited as food and raw materials by humans, so a chapter treats Clam and Human Interactions, including problems of contamination toxic to humans. An easy-to-follow, photographically illustrated Key to the Superfamilies precedes the systematic treatment. And what a fine treatment they have produced! Each taxon, from Bivalvia on down, is characterized, including authors, synonyms, sources and literature for the group. Here are provided anatomy and life history, as well as ancestry and presence in the geologic record, development, and habitat preferences. For each family there is a chart of Species Characters of the Family which contrasts characters peculiar to each group. For every species the common name and synonyms are included, as is a clear description, distribution, animal features where available or of interest, and intra-species variation. Both interior and exterior views are shown in the photographic plates (of type specimens wherever possible), as well as drawings of internal scars, hinge teeth and animal anatomy.

An Appendix of Image Sources gives the collecting data and the location that houses the specimen for almost every shell pictured in the plates. A Geologic Time Scale helps the novice to understand the sequence of geologic time as used in the book, while a Geographic Guide places geographic localities cited in the text. An extensive glossary familiarizes the reader with terms applicable to bivalves, and a complete index concludes the book. But the real star of this volume is the bibliography! One hundred and twenty-two large, close-spaced pages of bibliography containing an estimated 5000 entries! It is a treasure trove of bivalve references, and so large that it has its own separate guide to literature on various bivalve topics. It's a must-have for any serious bivalve collector!

Buying yourself a book for a holiday gift? If so, this is the book! Even the price is right in these days of big price tags on shell books. That's about 8 lovely, big, illustrated, information-packed pages for a dollar!

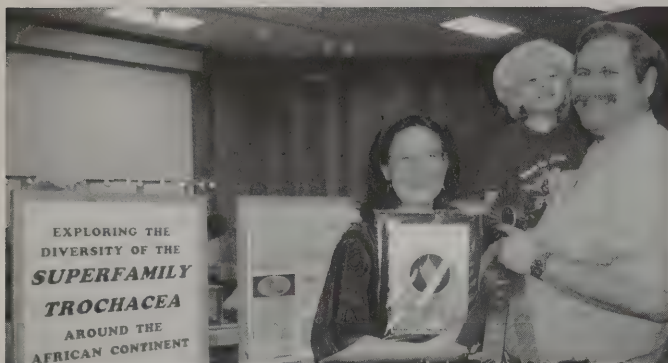
—LS

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COA Trophy Winners

Edited by Charlotte Lloyd

Photo Editing by Jim Miller



The entire Kwiat family—Helen, Darryl and little Christopher—are seen here celebrating Helen's COA Trophy win at the Naples 40th Annual Shell Show on February 18-20. Her exhibit, "Exploring the Diversity of the Superfamily Trochacea Around the African Continent," featured trochid shells with live animal photos. The 12-foot exhibit also included geographical and historical development, maps, and photos of ocean currents, habitats and endemic areas of Africa. Great job, Helen!



On July 15-16 of this year Charlotte Lloyd won the COA Trophy at the Jacksonville Shell Show. Charlotte's exhibit, "Molluscan Connections," displayed an amazing array of mollusks attached to natural and man-made objects. On view were *Spondylus* attached to a boot, a D-cell battery, bottles, and a Batman Belt, to name a few. It was indeed a popular exhibit with collectors and visitors alike.

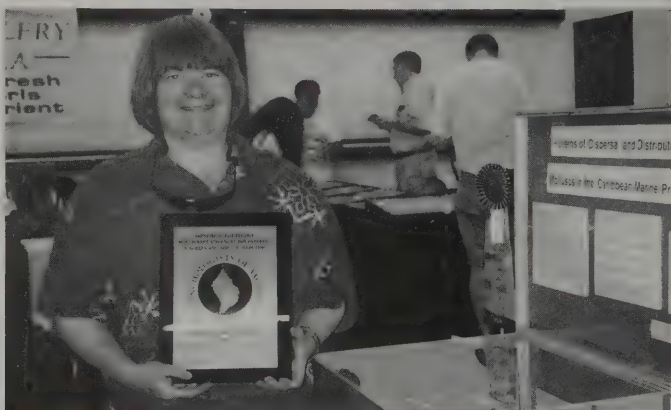
The Oregon Society of Conchologists held their 34th Annual Shell Show on July 18-24, 2000. Stephen Mc Mahan's exhibit, "Rare Shells From the Past," was the COA winner. Stephen focused on shells with a collecting history and favored by Victorian Age collectors. (Sorry, no photo available.)



COA member Vicky Wall won the COA Trophy on September 22-24, 2000 at the North Carolina Shell Show with her exhibit, "The Internal Beauty of Seashells." The 38-foot display used photographs from William Conklin's book of shell X-rays along with the shells depicted. Also included was information on how the internal structure of molluscs helps with their survival. Congratulations, Vicky!



Jean Offord happily accepts the COA Trophy at the Keppel Bay Shell Show in Queensland, Australia on July 1-2, 2000. Her 4 by 3 by 6-foot educational exhibit entitled "Man and Molluscs" included live molluscs in an aquarium, a very exciting feature.



Alice Monroe of Clearwater won the COA Trophy at the Central Florida Show on May 20-21 of this year. Alice's exhibit, "Patterns of Distribution of Molluscs in the Caribbean Marine Province," was 40 feet in length. It included factors that influence distribution of Caribbean molluscs. Great job, Alice!

2001 WINTER & SPRING SHELL SHOWS & OTHER EVENTS

by Donald Dan, COA Awards Director

- Jan. 19-21 **SPACE COAST SHELL FESTIVAL**, Melbourne, FL
The Melbourne Auditorium, 625 E. Hibiscus Blvd.
Jim & Bobbi Cordy, 385 Needle Blvd., Merritt Is., FL 32953
E-mail: cordy@yourlink.net (321) 452-5736
- Feb. 2-4 **BROWARD SHELL SHOW**, Pompano Beach, FL
Pompano Beach Recreation Center, NE 18th Av. & NE 6th St.
Jim VunKannon, 2219 NE 16th Court
Ft. Lauderdale, FL 33305 (954) 561-0120
- Feb. 9-11 **GREATER MIAMI SHELL SHOW**, N. Miami Beach, FL
Nova Southwest University
Fischer Graduate School of Education & Human Services
1750 NE 167th Street, N. Miami Beach
Mark Bethke, 3001 South Ocean Dr., Suite 4V
Hollywood, FL 333019-2804
E-mail: ferreter@gate.net (954) 922-8189
- Feb. 16-18 **SARASOTA SHELL SHOW**, Sarasota, FL
Sarasota Municipal Auditorium, Tamiami Trail
Lynn Gaulin, 3417 58th Ave., W. Bradenton, FL 34210
E-mail: ehgaulin@worldnet.att.net (941) 755-1270
- Feb. 16-18 **NAPLES SHELL SHOW**, Naples, FL
The Nature Conservancy, 14th Avenue N.
Gary Schmelz, 5575 12th Ave. SW, Naples, FL 34116
E-mail: schmelz@att.net (941) 455-4984
- Feb. 23-25 **ST. PETERSBURG SHELL SHOW**, Treasure Is., FL
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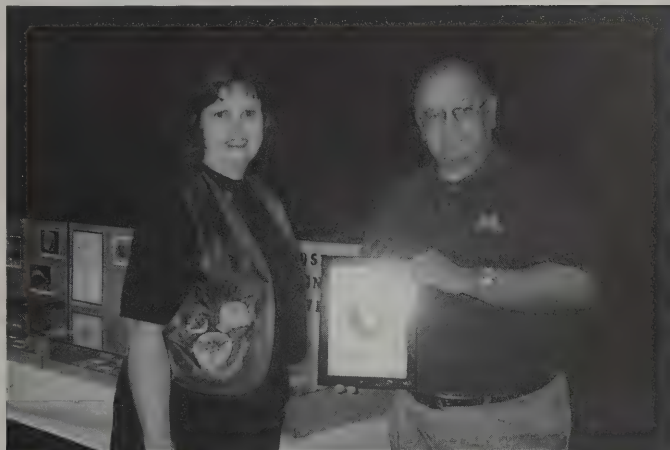
- Mar. 1-4 **SANIBEL SHELL SHOW**, Sanibel, FL
Sanibel Community Center, Periwinkle Way
Richard Willis, 5305 Darby Court, Cape Coral, FL 33904
E-mail: rwillis@ix.netcom.com (941) 540-7380
- Mar. 3-4 **XIII^{ème} RECONTRES INTERNATIONALES DU COQUILLAGE**
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Paris, France
M. & D. Wantiez, 88, Rue du General Leclerc
95210 Saint Gratien, France 33 (1) 34-17-00-39
- Mar. 8-10 **MARCO ISLAND SHELL CLUB SHOW XIX**
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Wesleyan United Methodist Church, Barfield Road
Jean Sungheim, P.O. Box 633
Marco Island, FL 34146 (941) 642-7247
- May 5-6 **XI BELGIUM INTERNATIONAL SHELL SHOW**
Antwerp, Belgium
Schijnpoort, Schijnpoort Straat
R. De Roover, Vorsterslaan 7
2180 Ekeren-Donk, Belgium 32 (3) 644-3429
- May 5-6 **CENTRAL FLORIDA SHELL SHOW**, Orlando, FL
Central Florida Fairground
Phyllis Gray, 1212 S. Eola Drive, Orlando, FL 32806
(407) 422-0253
- Jun. 9-10 **XX^{ème} SALON INTERNATIONAL DU COQUILLAGE**, Lutry, Switzerland
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- Jul. 7-11 **CONCHOLOGISTS OF AMERICA ANNUAL CONVENTION**
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COA Trophy Winners

Edited by Charlotte Lloyd

Photo Editing by Jim Miller



At the Sea Shell Searchers of Texas Shell Show on October 21-22 of this year Dave and Lucille Green took home the coveted COA Award with their 41-foot exhibit of cowries. Their display, entitled "Those Magnificent Cowries - a Worldwide Panorama," showed cowries with photos of the living animals. This display also won "Shell of the Show" for its *Cypraea broderipii*.

CLAM FARMS

We all know CITES has banned the taking of any species of *Tridacnidae*, the giant clams, because poachers taking them for their meat have endangered their survival. But did you know that these largest of mollusks, farmers of algae in their own tissues for nourishment, are themselves being farmed? Both meat and shell are available from what are being termed "Giant Clam Farms," provided the shipments are properly documented as being farm raised?

—From a note to *Conch-L* by Henk Mienis in Israel



Bunny and George Cook from Hawaii, annual participants at COA's conventions, are shown having a great time in Houston. Photo editing by Jim Miller



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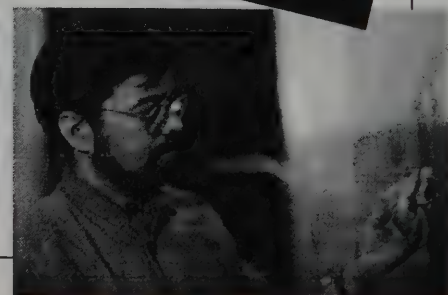
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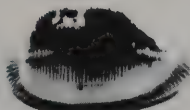
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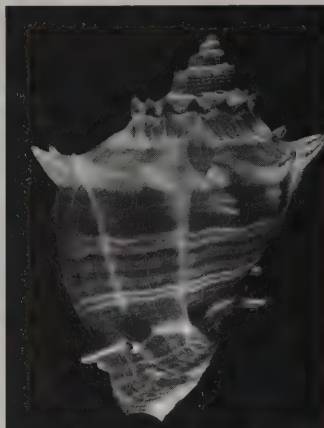
MELONGENIDAE of FLORIDA

by Kevan and Linda Sunderland and Mark Johnson

Photo editing by Jim Miller



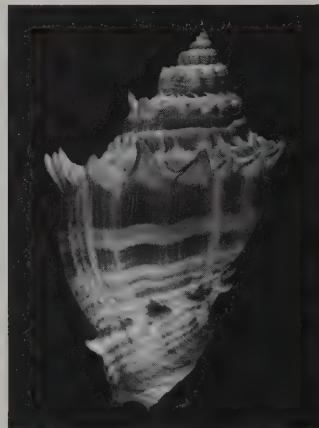
Melongena corona corona Gmelin, 1791. 102 mm. 2', in mud & grass, south of Everglades City, Florida.



Melongena corona corona Gmelin, 1791. 85 mm. 2', on mud, Cedar Key, Florida.



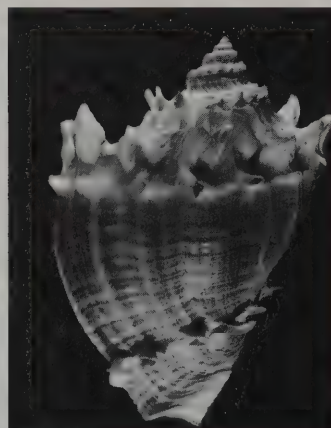
Melongena corona corona Gmelin, 1791. 94 mm. Low tide, North of Blue Heron Bridge, Lake Worth, Florida.



Melongena corona corona Gmelin, 1791. 107 mm. Low tide near bridge, Goodland, Florida.



Melongena corona corona Gmelin, 1791. 113 mm. Low tide, near causeway, Fort Myers Beach, Florida.



Melongena corona corona Gmelin, 1791. 68 mm. Low tide, Everglades City, Florida.

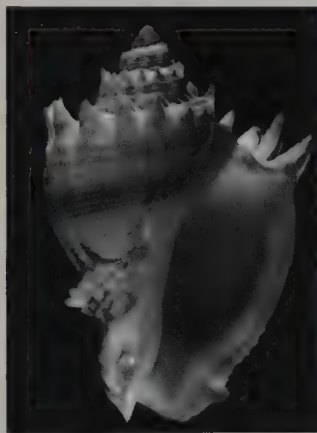


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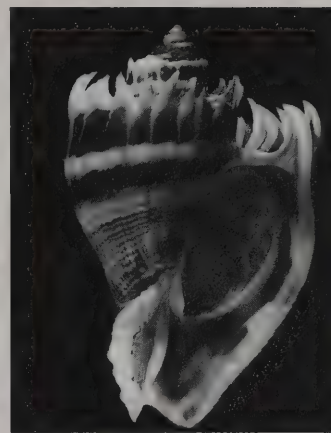
Editor's note: To supplement this coverage of Melongenids, readers with internet capabilities might wish to view the excellent on-line color coverage of this species Phil Poland has created for the web-

site of the Jacksonville Shell Club. A student of Florida Melongenidae for many years, Phil has published on this website some interesting findings about the *Melongena* forms and subspecies.

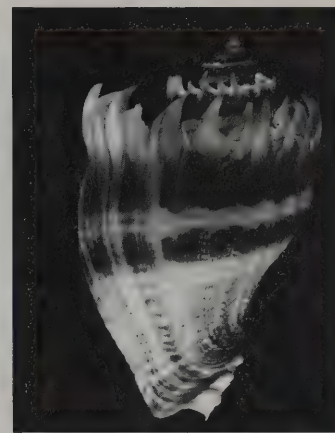
The intent of this feature is not necessarily to distinguish valid or invalid species, but to provide illustrations of taxa not popularly available, for the information of the collector.



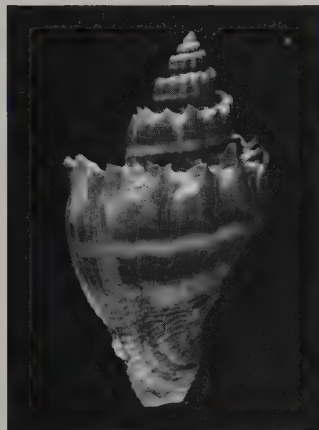
Melongena corona corona Gmelin, 1791. 88 mm. Low tide, Marco Island, Florida.



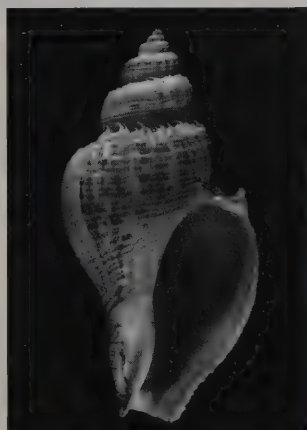
Melongena corona johnstonei Clench & Turner, 1956. 114 mm. Low tide, St. Joe's Bay, Florida.



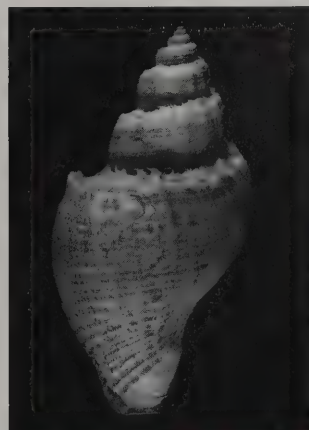
Melongena sprucecreekensis Tucker, 1994. 123 mm. Low tide, Spruce Creek, Brevard County, Florida. *Ex-Johnny Johnson collection*



Melongena corona altispira Pilsbry & Vanatta, 1934. 66 mm. Low tide, Long Boat Key, Florida



Melongena corona altispira Pilsbry & Vanatta, 1934. 94 mm. Lagoon, at low tide, Florida Bay, Florida Keys.



Melongena bicolor (Say, 1827). 50 mm. Low tide, Boca Chica Naval Air Station, Florida Keys.



REFERENCES

- Abbott, R. Tucker. 1976. *American Seashells*, Second Edition.
 Clench, W. J. And R.D. Turner. 1956. The family Melongenidae in the Western Atlantic. *Johnsonia*, Vol 3, No. 35, pp. 161-184.
 Tucker, 1994, *Bulletin of the Florida Museum of Natural History* 36 : 197-202, figs. 6a-c.

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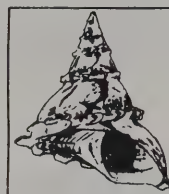
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Memories of Harold in Australia

by Thora Whitehead

Photo editing by Jim Miller

It was early in 1980 that Harold and Emily Vokes made their first visit to Brisbane. My visitors book fails to reveal the date, for they were of the elite band whose company in my shell room is so engrossing that the book is completely forgotten. With two such authorities "captive," out came the long-queried muricids and bivalves—the time just flew!

One small bivalve I could not place, even to family, proved interesting to Harold, and I provided him a specimen for further study. The results came as a surprise to me, some five years later.

Another day we were invited to participate in a field trip for students organized by Dr. Richard Willan, then of Queensland University. Harold and Emily were staying at a near-city motel, from which it is a fair 40-minute drive to the sea. Every now and then along the way, Harold would ask how much further it was to our destination. When I finally said, "Oh, only another couple of miles," there was immediate action in the back seat. Harold was putting his boots on! No mean feat in the back of a small Honda Civic Hatchback, especially as the other half of the seat was occupied by one of our junior club members.

Arriving at about lunch time, with a good two and a half hours before low tide, I was quick to pull out the lunch box and suggest that we all have a bite to eat before shelling. Harold and Emily looked doubtful about this and, walking to the water, found that some three feet of muddy, uninviting rock was already uncovered. Start collecting

at once and eat lunch later was their verdict! Emily was hoping to find our local *Bedevea hanleyi* with eggs, but though *Bedevea* were found, eggs were not. Shelling continued for several hours; happily it was a good spot for bivalves as the sand flats bared. Afterward we ate lunch.

Shell visitors are no rarity in Brisbane, but of all so far, I have dubbed Harold and Emily "keenest ever," a title that looks like holding a long time.

The next Vokes visit to Brisbane was in 1988. The photo shows Harold giving a thorough "going over" to a box of spare bivalves in the Lamprell shell room, while friend and traveling companion George Herman looks at cowries. Emily is out of the picture, in the *Murex* corner, naturally.

Harold and Emily traveled widely in Australia, both on the east coast and in Western Australia. I am sure there are many people with happy memories of their visits. Their down-to-earth friendliness and abundant enthusiasm won friends everywhere.



Harold Vokes sorts through Kev Lamprell's bivalve spares while George Herman examines Kev's cowries.

Photo by Thora Whitehead

They're Name-Changing Again!

It seems that an old familiar Florida and Caribbean bivalve species, *Chione cancellata* (Linné, 1758), has been revised and split in two. Peter D. Roopnarine of the California Academy of Sciences and Geerat Vermeij, University of California, Davis have determined, through morphological, morphometric and phylogenetic analyses of conchological characters, that *Chione cancellata* is a Caribbean species while the abundant, pretty bivalve of our U.S. shores is actually *Chione elevata* (Say, 1822). This difference has been overlooked by systematists for almost 200 years.

As reported in the *Journal of Molluscan Studies* (v. 66, p. 517)

specimens inhabiting waters off the United States and Central America south to Belize comprise a separate species based on shell sculpture, hinge morphology and relative size of the pallial cavity, differing in these characters from the true Gatunian (Southern Atlantic) *Chione cancellata*. The two species are presumed to be related and to have diverged from a common ancestor at least as long ago as the early Pliocene.

Said Thomas Say on the difference between the two species, "It certainly approaches very near to *V[enus] cancellata*, but it is distinguished by being much less obtuse before, and by having the longitudinal striae more numerous." On reconsideration years later, however, he reported the two taxa were synonymous.



Phil Schneider, master wood carver, displays his beautifully hand carved sea shells at the COA 2000 Bourse in Houston.

Photo editing by Jim Miller



Donald Dan and his assistant, Andy Dickson, displaying their specimen shell wares at the 2000 Bourse in Houston.

Photo editing by Jim Miller

Mid-Pleistocene Left Handed Whelks from Southern Florida

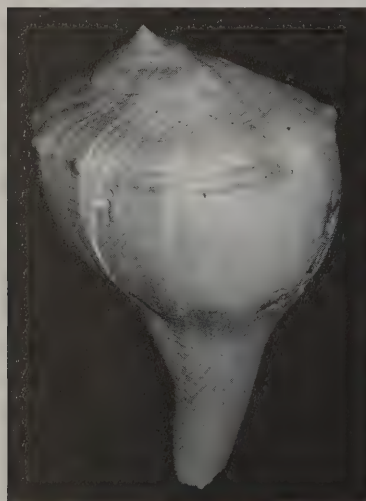
by Allen Aigen

Photography and photo editing by Jim Miller,
Photographic Editor

The melongenid whelks are one of many rapidly evolving and rather variable groups that occur throughout the Pliocene and Pleistocene of southern Florida. *Busycon* (*Sinistrofulgur*), the left handed whelks, may have as many as five Recent species (Hollister, 1958, and Kent, 1982) or as few as one (as determined by Wise, Dillon and Harasewych, 1998. See this and more on the Jacksonville Shell Club's website: <http://home.sprynet.com>) Because the larvae stay in capsules these species do not disperse easily. So when a new area is successfully colonized, it can form a distinctive local population. Colonies can later be separated by unfavorable areas (e.g. rocks instead of sand) especially as shore lines changed with changes in sea level during the Ice Age. Colonies can be distinct, but may interbreed and merge at the edges, if they are still contiguous. Some variations may also be ecologically controlled, for instance the swollen ridge on *B. perversum*, which may be a response to crab predation.

When you are dealing with fossil species, it is even harder to set limits. The southern Florida peninsula has a complicated history of rapid changes in sea level and restricted endemic faunas. This has led to significant time-restricted forms within variable lineages in groups such as *Busycon*. Describing two distinct forms as separate species is, however, definitely not a good idea when the forms merge within large collections from the same stratum. If you are familiar with the controversies concerning human fossils, with the many forms that 'splitters' named and the few that 'lumpers' accept, realize that I am speaking of the same time frame and similar reasoning is applicable.

In this article I will discuss variations in *B. (S.) roseae* Petuch 1991, from the mid-Pleistocene Bermont Formation of southern Florida. I will also compare it to similar species. The stratigraphic chart will help explain the many time/rock faunal names used.



***Busycon roseae*. Mature shell, 130 mm diameter. Note the mostly rounded spines, but only on the body whorl. The coarse sculpture becomes weak on the body whorl, especially at mid-body. Note that the spine at the growth-line is asymmetrically pointy, the others rounded.**

Petuch renamed many of the Southern Florida stratigraphic names based on the work of Scott, 1992. He characterized the faunal units within formations by their distinctive gastropods (using them as index fossils for the units), and named many of them as new species. These are necessarily "form species" or morphospecies, as we have no living animals to compare. Comparing the animals can sometimes show that distinctive shell forms are just varieties of the same species. Probably all fifteen members of the described Pliocene and Pleistocene *Busycon* (*Sinistrofulgur*) species complex (see Petuch, 1994) can best be considered subspecies, or varieties (technically synonyms) of previously named species. However, some

forms are distinctive and are restricted to small stratigraphic units. Thus they have useful biostratigraphic significance as index fossils for those units. Petuch named many of these "form species," and also many of the corresponding stratigraphic units. However, the limit of variability of those species, insofar as it is knowable, should not be restricted to the distinctive forms just for biostratigraphic convenience, as it appears that Petuch sometimes does (e.g. Hargreave, 1995).

This note is an attempt to clarify the nature and limits of one of the species illustrated in Petuch's 1994 *Atlas*. As this article is intended to clarify, but not to change, systematics, I use species names to refer to the populations represented by the holotype, and leave synonymy to better documented studies.

This study concerns a collection that I made from South Bay, also known as the North New River Canal dig. It is about one to two miles (1.5 to 3 KM) south of South Bay, Palm Beach County, Florida, along State Road 27. This is a well known, well picked over locality that can still yield nice specimens to a hard working, persistent collector (Frank, 1996.) Collectors who have Bermont Formation material from this or other localities can possibly help determine the nature and limits of the left handed whelks there. All statistics in this study refer to 32 immature and submature specimens from this locality. As this was a picked over locality, smaller specimens were the most common, but larger ones were also found.

Two widespread forms of *Busycon* (*Sinistrofulgur*) occur in the Bermont Formation. One, *B. roseae*, was described from small (holotype 70-mm long, about 37-mm diameter), spineless, rounded specimens which are immature (Petuch, personal communication, 1998). The other, which apparently intergrades with the spineless form, has small, generally rounded spines (rarely asymmetrically pointed). The holotype, being entirely spineless, is an extreme form, representing only about 12% of the sample of 32 measured specimens noted above. It appears to represent a larger percentage in younger strata (Holey Land Unit Fauna), but I don't have significant numbers with clear stratigraphy. Most specimens (76%) of the same size as the holotype have at least part of the body whorl free of significant spines. They are thus easily referred to *B. roseae*. Both larger and smaller specimens are significantly less likely to have a spine free body whorl, but they are clearly a part of the same population.

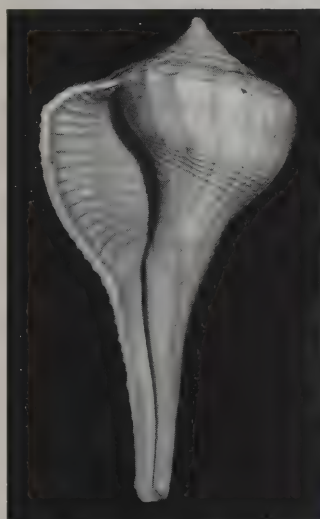
McGinty (1970) and Hoerle (1970) made, respectively, stratigraphic and faunal studies of the Bermont Formation (which they referred to, informally, as the "Glades Unit.") They reported two left handed *Busycon* species from a now long closed shell pit at Belle Glade, Palm Beach County, Florida, about 4 miles (6.4 KM) east of the South Bay site. Hoerle referred the common, spiny form to the Recent species *B. sinistrum* Hollister, 1958, which is the Florida lightning whelk. The uncommon, smooth form she referred to *B. aspinosum* Hollister, 1958; generally it is now considered a synonym of *B. sinistrum*. Unlike *B. roseae*, *B. sinistrum* characteristically has pointy spines throughout its growth, which in the *B. aspinosum* form become obsolete only in maturity.



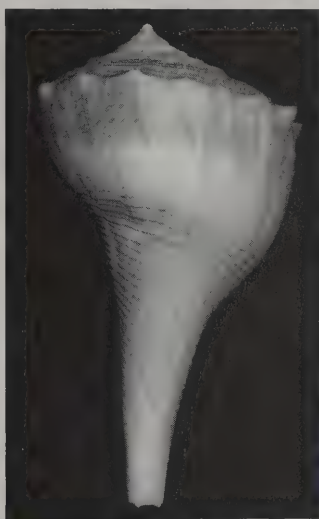
***Busycon roseae* - Nearly mature fragment, 85 mm diameter. Note the flattened, smoothly symmetrical spines and coarse sculpture. Small spines are visible on some of the early whorls.**

Hoerle documented the described endemics, the Pliocene extensions, and the many Recent species that had their origins in the Pleistocene. She did not assume that apparent variants of named species were particularly significant, and generally lumped them together with typical forms. Petuch made different assumptions, and split off many new species (although without sufficient documentation to satisfy most modern malacologists). These include the spineless *Busycon* (*Sinistrofulgur*) form that he named *B. roseae*. He did not, however, document the spined forms that apparently intergrade with *B. roseae* and ultimately evolved into *B. sinistrum*.

B. roseae was originally described from the now closed Griffin Pit on the Broward/Palm Beach County border between State Road 27 and the Miami Canal, about 22 miles (36 KM) south of South Bay. It was described as coming from a stratigraphic unit that Petuch (1994) refers to as the Holey Land Unit Fauna of the Pleistocene Okeechobee Formation. (Petuch had previously described (1990) The Holey Land Unit as a basal subunit of the Middle Pleistocene Bermont Formation.)



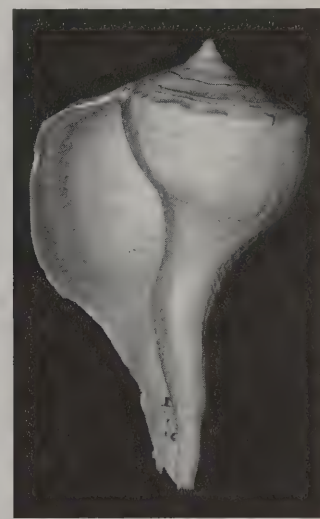
Busycon roseae immature, 33 mm diameter. This exhibits the typical coarse sculpture, thickened shell and high spire, but small spines are present.



Busycon roseae - immature, 37 mm diameter, with prominent but rounded spines and subdued sculpture.



Busycon roseae - submature, 78 mm diameter, with weak sculpture (inside and out), thin shell, a few weak spines and a relatively narrow aperture.



Busycon roseae - immature; 41 mm diameter with weak sculpture inside and out, with knobby spines and a relatively flared aperture.

Petuch's 1994 *Atlas*, however, gives the locality of the holotype and of another pictured specimen as the South Bay locality, and the stratigraphic horizon as the Bermont Fauna, **without** commenting on the changes. I have also found *B. roseae* from other localities, where it is associated only with Holey Land species, and also where it may have come from either the Holey Land and/or Bermont Faunas. The South Bay locality lacks all typical Holey Land species and corresponds clearly to the Bermont Faunal unit. This species, therefore, is definitely from both the Bermont Fauna and from the Holey Land Unit Fauna. Note that dredging operations typically mix strata and therefore rarely allow certainty of stratigraphy from this area. Petuch, however, professes little or no uncertainty in his stratigraphy. For those who want a better background, William G. Lyons' 1991 study of Plio-Pleistocene *Latirus* species is a valuable source of stratigraphic information for southern Florida.

B. roseae is characterized by its broadly rounded whorls, lack of spines, and coarse sculpture. Details of the cording vary from specimen to specimen. Forty-four percent of the measured specimens from South Bay have weak or obsolete mid-body cords, although the species description specifies coarse mid-body cords. The spire angle varies from about 109 to 116 degrees in the two published specimens, 95 to 136 degrees in my measured specimens (averaging 129 degrees.

I used a contact goniometer on the last two whorls. The two protoconch whorls always have a much smaller spire angle, and get in the way of reading the angle.) The spire whorls are slightly depressed sub-suturally. Most immature specimens have a thick shell (0.9 to 2.9 mm, averaging about 2.0 mm, increasing inconsistently with diameter). The shell is further reinforced with coarse lirae (present in about 90% of the specimens) starting about a centimeter inside the lip. The thin edge is generally broken off. The number of whorls and diameter do not correspond very well, so the expansion rate is another variable.

Petuch in his 1994 *Atlas* attempts to document almost all the large gastropods of the Florida Plio-Pleistocene. Although he shows two photos of *B. roseae*, they both lack significant spines (the type description notes "obsolete knob-like undulations"). There is no spined, left-handed whelk pictured for the Bermont Fauna, in spite of its abundance, nor is there **any** form documented from the Loxahatchee Fauna of Petuch, 1994. (The Loxahatchee was previously considered the upper portion of the Bermont Formation. It **may** be present at South Bay.)

At South Bay the forms with some spines are in the majority (about 88%). The spines are small, closed, rounded and nearly horizontal, corresponding to the knob-like undulations of the type, only bigger. (Asymmetrical sharp spines, characteristic of *B. sinistrum*, appear rarely, scattered randomly on a few specimens.) Spiny forms are slightly more angular than the typical *B. roseae*, but can retain the same overall shape (slightly broader through the midwhorl than *B. sinistrum*), coarse sculpture and thick shell even to submaturity (as shown by one large (85 mm diameter) fragment). I use diameter as the siphonal canal generally is broken off for an unknown length.) I also have a well preserved submature specimen (about 5 1/2 post-protoconch whorls) of 78 mm, which shows increasingly larger spines and weakened sculpture on the last half whorl. It also has a thinner shell. A mature shell of about 130 mm diameter, with a thickened lip (without lirae) and 6 whorls, shows characteristics of *B. roseae* in its early whorls (rounded, spineless shoulder) but has about 13 broad flat spines on its angular body whorl shoulder. The sculpture of coarse cords is relatively weak. (Cords stay the same size as the shell increases, and one to three finer cords and many very fine lirae appear between them.) The midbody cords are obsolete.

I also have submature forms from South Bay which seem to show
(Continued on page 31)

THE OLD SHELL GAME

by Paul Monfils

Photos by the author

Photo editing by Jim Miller

The First Door

"w/o" — When it appears on a shell dealer's price list, it mysteriously causes the value of the listed specimen to increase. It provides evidence that the shell was collected alive in its natural habitat. Indeed, it designates a "complete" specimen. With operculum! You can't talk shells without talking opercula ("operculum" is also acceptable)—unless of course you collect only cowries. Like many frequently used four-syllable words, "operculum" has been abbreviated by those who say it most often, and shell collectors speak of "opercs," or sometimes just "percs," while those less conversant in matters molluscan will speak of the snail's "trap door."

"Operculum" is a Latin noun which, like many Latin terms, has been incorporated into scientific English. Derived from the verb "operio"—to cover or hide—it designates a lid or cover, so the term is quite appropriate in its malacological usage. Indeed, the principle function of an operculum is to seal the aperture of the shell when the snail withdraws, providing a barrier against predators, irritants, and desiccation. So effective is this barrier that operculate snails have been known to pass through the digestive tract of predatory fishes, emerging alive and apparently unharmed. In the conchs (family Strombidae), the slender, often serrated operculum has limited value in sealing the aperture, but is employed as a means of rapid locomotion. The animal jabs the sharp end of its operculum into the sediment and, with a quick contraction of its muscular foot, leaps forward several inches at a time. It has been said that a conch also uses its operculum as a defensive weapon. Anyone who has picked up a living specimen, only to be jabbed by its sharply pointed operc, might easily reach that conclusion; but the animal's motive is probably escape, not attack. It is only trying to run away.

The human propensity for exploiting every available component of the natural environment has resulted in a broad range of uses for mollusc shells and, to a lesser extent, their opercula. Probably the earliest reference to human utilization of gastropod opercula is in the Old Testament book of Exodus, where God instructed Moses in the making of sacred incense. One of the required ingredients was "onycha," a name derived from the Greek "onyx," meaning a claw or talon. A biblical glossary defines "onycha" as "the powdered claw of the Red Sea wing shell which, when burned, emits a strong odor resembling that of castoreum" (a type of mammalian musk). In modern conchological terms, this description certainly refers to the operculum of a *Strombus*. Just which conch species provided this precious material is uncertain, but perhaps it was *Strombus tricornis*, which is endemic to the Red Sea region, and has a broad, "wing like" lip.

Not surprisingly, the rich colors and brilliant natural gloss of turban shell opercula, particularly the bright green "cat eye" of *Turbo petholatus*, have long attracted the attention of humans. Early South Sea Islanders used them as eyes in carved wooden or stone figures. Jewelry makers have set them into rings or brooches as natural cabochons, or drilled and linked them into bracelets. Amphorae filled with the brilliant orange opercula of *Astraea rugosa* have been recovered from ancient mediterranean shipwrecks. In some European countries, an "eye stone" was frequently carried as a personal talisman to provide protection against the effects of the "evil eye." Curiously, another, unrelated, early European custom may likewise have contributed to the term "eye stone." A small, smooth Turbo operculum, kept in the med-

icine cabinet, was slipped under the eyelid as a means of removing a cinder or other foreign object lodged in the eye. Though I haven't personally put this technique to the test, I have little doubt regarding its efficacy. An operculum placed against one's cornea would likely generate a copious flow of tears, sufficient to flush away a foreign particle, yet would be smooth enough to avert any real damage. (NOTE - do NOT try this with a *Strombus* operculum!).

The essential substance in opercular construction is tough, yellow-brown conchiolin, a complex mix of proteins and glycoproteins (protein-sugar combinations), rather like the substance of fingernails and horses' hooves. This material is secreted not by the shell-producing mantle of the mollusc but by a pad of specialized epithelial cells, the opercular disc, situated on the posterior, dorsal aspect of the foot. In some gastropod species, an additional layer of calcium salts is deposited over the conchiolin base, often far surpassing it in thickness and density. Typically we refer to such heavily mineralized opercula as "calcareous" or "shelly," and to uncalcified opercula as "corneous" or "horny." However, this categorization is not absolute, first because all opercula are at least partially corneous, and secondly because a continuum of intermediate forms exists between the extremes. Some snails, particularly terrestrial prosobranchs, secrete only a thin, fragile film of calcium salts over the thicker conchiolin base. In *Liotia*, a marine genus resembling miniature turban shells, the opercs appear corneous, but may have minute calcareous granules embedded in them. Heavily calcified opercula occur in Neritidae, Phasianellidae, Turbinidae, and Naticidae. Naticidae includes species with both calcified and uncalcified opercs, as does Turbinidae—if you include the genus *Angaria* in that family, as some do.

An operculum is produced in a majority of marine gastropod families, but there are a number of exceptions. Prosobranch gastropods, which include most of the major marine families popular with collectors (as well as a number of fresh water and terrestrial groups), are mostly operculate; but an operculum is lacking in the Cypraeoid families (Cypraeidae, Triviidae, Ovulidae), in the miters (Mitridae), nutmegs (Cancellariidae), tun shells (Tonnidae), fig shells (Ficidae), and margin shells (Marginellidae). It is also absent in a variety of unrelated families which have adopted a "limpet-like" mode of existence, in which the substrate serves to seal the aperture (Acmaeidae, Patellidae, Lottiidae, Fissurellidae, Calyptraeidae, Hipponicidae, Haliotidae). In Capulidae, another limpet-like family, an operculum exists in the embryonic animal, but not in the adult, a characteristic shared by the purple sea snails (*Janthina*). The harp shells (Harpidae) were an inoperculate family until the genus *Morum*, which possesses a minute vestigial operculum, was reclassified into that group. A few prosobranch families, including volutes (Volutidae), olive shells (Olividae), turrids (Turridae), and moon snails (Naticidae) include both operculate and inoperculate species. Heterobranch gastropods, a small group including the sundials (Architectonicidae), pyrams (Pyramidellidae), and the limpet-like Amathinidae, are operculate except for the last-named family. Opisthobranch gastropods, which include the various "bubble shell" families and the shell-less nudibranchs, are inoperculate as adults (except Retusidae and Acteonidae), though some may possess an operculum while immature. Pulmonate ("lung-breathing") snails, which include the majority of terrestrial species, lack an operculum, except for the genus *Amphibola*, a small group of odd brackish water snails native to New Zealand. Inoperculate land snails, in order to avoid desiccation during dry weather, produce a "simulated operculum" or epiphragm, a mucus plug or membrane which dries and hardens, sealing in moisture until verdant pastures return.

It has been postulated that the gastropod shell and operculum are homologous to the two-part shell of a bivalve, and some have suggested that one may have arisen from the other. Such a development seems unlikely, given that the operculum is not a product of the mantle. However, it is interesting to note that perhaps the first to suggest

such a relationship was none other than Aristotle, in his treatise "On the Parts of Animals," circa 350 BC (though his interpretation of opercular function was a bit fanciful). He writes: "Those with turbinate shells may, indeed, after a certain fashion, be said to resemble bivalves. For they all from their very birth have an operculum to protect that part of their body which is exposed to view. This is the case with the purpuras, with whelks, with nerites, and the like. Were it not for this, the part which is undefended by the shell would be very liable to injury by collision with external objects."

Growth of the operculum, once the embryonic operculum, or opercular nucleus, is formed, progresses in one of two principle patterns, either spirally or concentrically, with spiral forms further subdivided into multispiral (or polygyrous) types with many whorls (*Trochus*, *Angaria*, *Pleurotomaria*, *Cerithidea*); and paucispiral (or oligogyrous) forms (*Polinices*, *Littorina*, *Turbo*, *Cerithium*, *Epitonium*) with few whorls. The latter distinction is not totally clear-cut, as intermediate species form a gradual transition across the spectrum. Conchiolin is deposited to a spiral operculum along one edge only, and the operculum gradually rotates on the opercular disc as it grows, in a manner analogous to the spiral growth and rotation of the shell itself, as new material is secreted along the edge of the lip. In contrast, concentric opercula (*Murex*, *Cymatium*, *Phalium*, *Turris*) grow by deposition on all edges, and do not rotate during growth. In many species secretion is greater on some edges of the operculum than on others, resulting in an eccentric (off center) nucleus, which may be variously located, depending on the species. Certain gastropods, including some representatives of Cassidae, Buccinidae, and Personidae, produce a spiral operculum initially, but switch to a concentric growth pattern early in their development.

Some thin, corneous, multispiral opercula, particularly those of the family Trochidae, do not match the shape of the shell aperture, and must bend or fold when the animal withdraws into its shell. This process is often facilitated by a thin outer margin which flexes outward as the operculum is drawn inward. Such an operculum is referred to as flexiclaudent (from the Latin "claudere," to close), and can grow only when the animal is extended and the operculum is in its relaxed state. A flexiclaudent operculum, of course, cannot be calcified. In other spiral opercula, as well as concentric opercula, the shape generally matches the shape of the shell aperture; in fact, the animal uses the aperture as a template in secreting the operculum. Therefore such opercula can grow only when the animal is withdrawn and the operc is snugly in place. Opercula of this type are termed rigiclaudent. In some species, such as *Polinices* moon snails, thin rigiclaudent opercs do flex outward somewhat at the edges when sealing the aperture. Only the family

Potamididae includes genera with both flexiclaudent (*Tympanotonus*, *Pyrasus*) and rigiclaudent (*Telescopium*) opercula.

Flexiclaudent opercs can be difficult to mount in a shell, since they are usually thin, and lose their flexibility when dried. Any effort to push them into the aperture is likely to result in breakage. Soaking them for a few hours in warm water with a small amount of liquid dish detergent will soften them so that they can be safely inserted and glued to a cotton plug, then allowed to dry in place. Larger opercula which tend to curl up when dried, such as those of *Rapana*, *Purpura*, and similar muricids, can be softened and flattened by a similar treatment, but a longer soaking is required, at least 24 hours. Then place them between paper towels, under a heavy weight like a large book or a brick, and allow them to dry thoroughly. Don't rush it. If you try to flatten them before they are completely flexible, they will crack; and if you take them out of the press before they are completely dry, they may recur. Note that some opercs are not supposed to be flat. Many muricid and fasciolarid opercs, for example, have a natural "curl" to them. These should not, and in fact cannot be flattened; likewise for the naturally concave/convex opercula of *Angaria* and some trochids. The extended detergent soak will also remove any lingering odor which an operculum has absorbed from a poorly cleaned shell.

I never cease to be amazed at the number of shells I receive with the opercs mounted upside down and/or inside out. Then of course, there are the shells which contain opercs from a different species—or genus—or family! And the *Cancellaria* shells I received with buccinid opercs in them (*Cancellaria* species don't have opercs). Anyway, that's another story. There is not room here for an extended tutorial on the correct positioning of opercula, but remember that in most cases, the shape of the aperture is the best clue to proper orientation. Even a "round" operc like that of a *Turbo* is usually not perfectly circular, and neither is the aperture. Use a glue which can be removed later if necessary. Avoid "airplane glue," Duco cement, epoxy, super glue, and the hot glue gun! An ordinary "white glue" or "school glue" will hold securely, but can later be dissolved. A small dab on the center of the underside is all that is required, and will avoid the possibility of accidentally cementing an edge of the operc directly to the shell. Some people like to apply oil or glycerin to the opercs. It does darken them and make them look more attractive, but I prefer them natural. Don't oil the underside, or the glue won't stick. If you choose not to mount your opercs, they should be identified with a small number, to make sure they easily can be matched to the correct shell, after the drawer tips over. A little care goes a long way toward making your collection more attractive, more interesting, and more valuable.

(Illustrations can be seen on pages 24, 25 & 26)

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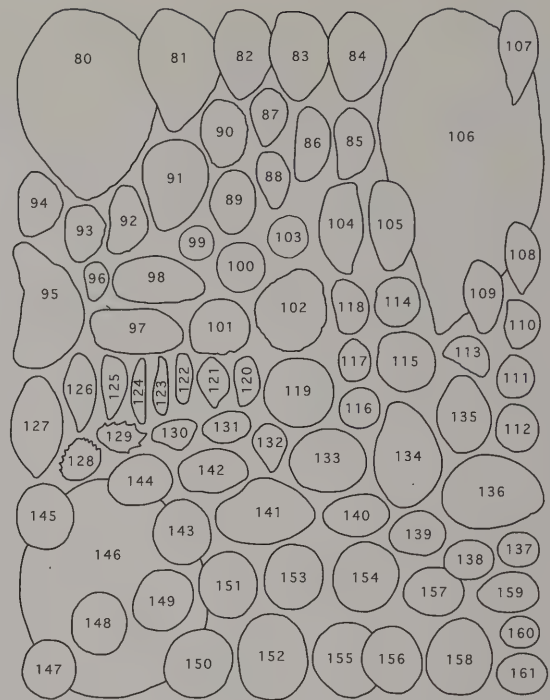
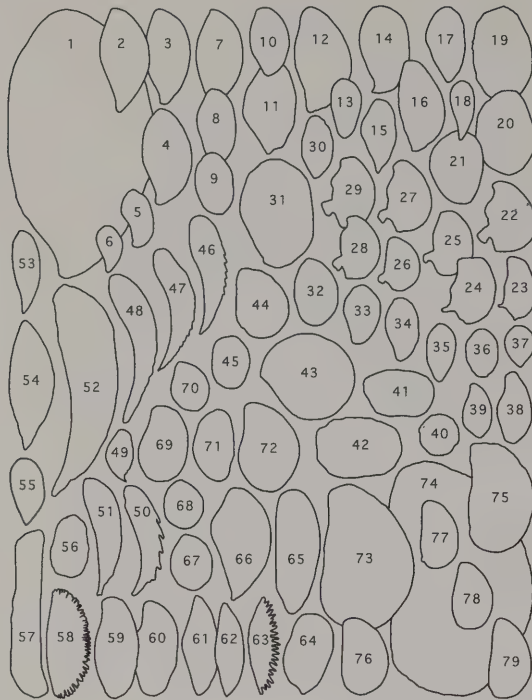
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KEY TO OPERCULUM PLATES

[F] = fresh water, [T] = terrestrial, All others are marine species.

PLATE 1:

- 1 *Pleuroploca gigantea*
- 2 *Fasciolaria tulipa*
- 3 *Fusinus novaehollandiae*
- 4 *Pleuroploca trapezium*
- 5 *Opeatostoma pseudodon*
- 6 *Latirus recurvirostratus*
- 7 *Bursa (Bufonaria) subgranosa*
- 8 *Bursa (Bufonaria) crumena*
- 9 *Bursa (Colubrellina) awatii*
- 10 *Buccinulum corneum*
- 11 *Colus simpsoni*
- 12 *Neptunea tabulata*
- 13 *Phos crassus*
- 14 *Neptunea lyrata decemcostata*
- 15 *Austrofuscus glans*
- 16 *Babylonia zeylandica*
- 17 *Burnupena cincta*
- 18 *Cantharus melanostomus*
- 19 *Buccinum undatum*
- 20 *Buccinum middendorffi*
- 21 *Buccinum humphreysianum*
- 22 *Nerita peloronta*
- 23 *Neritina latissima*
- 24 *Clypeolum granosum*
- 25 *Nerita versicolor*
- 26 *Nerita plicata*
- 27 *Nerita balteata*
- 28 *Nerita scabricosta*
- 29 *Nerita polita*
- 30 *Colubraria muricata*
- 31 *Ranella olearia*
- 32 *Fusitriton oregonensis*
- 33 *Cymatium (Ranularia) testudinarium*
- 34 *Cymatium (Monoplex) parthenopeum*
- 35 *Cymatium (Monoplex) corrugatum*
- 36 *Gyrineum (Biplex) perca*
- 37 *Distorsio perdistorta*
- 38 *Ancilla glabrata*
- 39 *Ancilla albocallosa*
- 40 *Cerithidea anticipata*
- 41 *Architectonica nobilis*
- 42 *Architectonica trochlearis*
- 43 *Pleurotomaria westralis*
- 44 *Campanile symbolicum*
- 45 *Cerithium nodulosum*
- 46 *Strombus pugilis*
- 47 *Strombus listeri*
- 48 *Lambis lambis*
- 49 *Struthiolaria papulosa*
- 50 *Strombus kleckhamae bohollensis*
- 51 *Strombus raninus*
- 52 *Strombus costatus*
- 53 *Tibia powisi*
- 54 *Tibia fusus*
- 55 *Turris indica*
- 56 *Amphibola crenata*
- 57 *Cassis tuberosa*
- 58 *Semicassis undulatum*
- 59 *Galeodea rugosa*
- 60 *Galeodea echinophora*
- 61 *Phalium bandatum*
- 62 *Phalium flammiferum*
- 63 *Semicassis fauotris*
- 64 *Tudicla spirillus*
- 65 *Turbinella pyrum*
- 66 *Vasum (Altivasum) flindersi*
- 67 *Amaea ferminiana*
- 68 *Epitonium scalare*
- 69 *Pila globosa* [F]
- 70 *Campelema decisum* [F]
- 71 *Paludomus neritea* [F]
- 72 *Viviparus malleatus* [F]
- 73 *Polinices (Lunatia) heros*
- 74 *Polinices (Lunatia) lewisi*
- 75 *Polinices (Lunatia) catena*
- 76 *Natica (Naticarius) millepunctata*
- 77 *Natica fanel*
- 78 *Natica chemnitzii*
- 79 *Natica acinonyx*

PLATE 2:

- 80 *Murex (Chicoreus) ramosus*
- 81 *Murex (Siratus) alabaster*
- 82 *Murex troscheli*
- 83 *Murex (Bolinus) brandaris*
- 84 *Murex pecten*
- 85 *Thais (Haustorium) haustorium*
- 86 *Purpura columellaris*
- 87 *Murex (Pteryonotus) miyokoae*
- 88 *Murex (Pterocheilus) acanthopterus*
- 89 *Murex (Haustellum) haustellum*
- 90 *Murex (Muricanthus) radix*
- 91 *Rapana venosa*
- 92 *Ceratostoma foliatum*
- 93 *Ceratostoma japonica*
- 94 *Thais orbita*
- 95 *Rapa rapa*
- 96 *Coralliophila squamosa*
- 97 *Xenophora mekranensis konoii*
- 98 *Xenophora gigantea*
- 99 *Calliostoma granulatum*
- 100 *Tegula regina*
- 101 *Bathybembix bairdi*
- 102 *Norrisia norrisi*
- 103 *Calliostoma scotti*
- 104 *Busycon sinistrum*
- 105 *Busycon canaliculatum*
- 106 *Syrinx aruanus*
- 107 *Pugilina cochlidium*
- 108 *Melongena corona*
- 109 *Hemifusus tuba*
- 110 *Viana regina* (T)
- 111 *Pomatia olivieri* (T)
- 112 *Tropidophora foveolata* (T)
- 113 *Alcacia submarginata* (T)
- 114 *Aulopoma itieri* (T)
- 115 *Incidostoma confusum* (T)
- 116 *Cyclophorus ceylonicus* (T)
- 117 *Littorina littorea*
- 118 *Littorina zebra*
- 119 *Angaria sphaerula*
- 120 *Terebra strigata*
- 121 *Terebra guttata*
- 122 *Conus circumciscus*
- 123 *Conus loroisii*
- 124 *Conus geographus*
- 125 *Voluta (Harpulina) loroisii*
- 126 *Fusivoluta barnardi*
- 127 *Neptuneopsis gilchristi*
- 128 *Nassarius fossatus*
- 129 *Bullia similis*
- 130 *Demoulia abbreviata*
- 131 *Nassarius wolffi*
- 132 *Columbarium eastwoodae*
- 133 *Astraea rugosa*
- 134 *Phasianella australis*
- 135 *Phasianella ventricosa*
- 136 *Astraea undosa*
- 137 *Astrarium saturnum*
- 138 *Astrarium rotularia*
- 139 *Astraea tecta olfersii*
- 140 *Astraea unguis*
- 141 *Bolma tayloriana*
- 142 *Astrarium tentoriformis*
- 143 *Turbo fluctuosus*
- 144 *Astraea longispina*
- 145 *Turbo torquatus*
- 146 *Turbo jourdani*
- 147 *Turbo coronatus*
- 148 *Turbo cinereus*
- 149 *Turbo brunneus*
- 150 *Turbo chrysostomus*
- 151 *Turbo argyrostomus*
- 152 *Turbo sarmaticus*
- 153 *Turbo necnivosus*
- 154 *Turbo cidaris*
- 155 *Turbo reevei*
- 156 *Turbo petholatus*
- 157 *Bolma modesta*
- 158 *Turbo intercostalis*
- 159 *Guildfordia yoka*
- 160 *Astrarium haemotranga*
- 161 *Astrarium calcar*





Shelling in Ecuador Part III: New finds in Ecuador – 1999 Part III

by José Coltro

Photos by Marcus Coltro*

Photo Editing by Ross Gunderesen

Neither Marcus nor I had shelled outside Brasil for a long time, so we decided to go to Ecuador in September '99. We booked an Ecuadoriana airline flight to Quito with one stop in the middle of the Amazonian forest at Manaus, the largest Brazilian city. Our best divers, Alfredo Bodart and Gilmar Candido were going with us. It was Gilmar's first international trip and he was quite nervous!

Help planning the trip came from our friend Dr. Noboa, Vice-President of Ecuador. First stop was Quito, and dinner with Dr. Noboa, carefully scheduled because he's a man whose time is really precious. However, our flight to Manaus was three hours late!

I never dined with the vice-president of a country before. The restaurant was crowded with dozens of policeman and security people! Dr. Noboa, who arrived just 5 minutes late, was the same nice man we had met when he was in Brasil working as special Ambassador for the Ecuador/Peru border conflict. Gilmar was so nervous about meeting Dr. Noboa that he started to drop glasses, knives, etc. Finally, realizing how pleasant a man Dr. Noboa is, he relaxed; then he started to make jokes with me, referring to me as El gordo (the fat!). I don't know which was worse. The next day Dr. Noboa took us for a tour of the Presidential palace in downtown Quito.

We took the road to Esmeraldas. We had never been to the Ecuadorian north coast before, so Dr. Noboa warned that we could have diving problems from a strong undertow along the coast. He also cautioned us about the road condition. Most of the roads had been destroyed in 1998/99 by the heavy El Niño rains; although he had been named sponsor for the roads, he said, he had repaired only a part of them because of the great expense involved. Exaggeration about the road conditions, I thought, but no, Dr. Noboa had told the most tragic truth! The road leaving Ecuador wasn't bad at all, but in the middle of the mountains where the rain forest begins we started finding huge holes in the pavement; in some areas the pavement just disappeared. We took over 8 hours to complete a 4 hour trip between Quito and Esmeraldas!

Once in Esmeraldas, we sought a hotel on the south coast, reputed to have good beaches. As we searched, we admired the way the city looked at night on the horizon, but we didn't stop in Esmeraldas. It was



Homalocantha oxycantha

the last week of school holidays and almost everything was completely full. And I was so tired! We wound up in the tiny village of Sua Beach at 9 p.m. where a small, rustic restaurant attracted our attention. The owners, a nice German lady and her Chilean husband, brought us such delicious food that we started to talk with them. We found they had rooms to rent and at that moment they had one for four people—perfect for us. The simple but clean little apartment had just one bathroom, no hot water, and one toilet. But my fatigue and the wonderful food made the stay well worth it!



Engina maura



Engina tabogaensis

A local man, Miguel, offered his services as a guide. I never use a guide when I travel, preferring to try by myself, but I decided to accept his help. He took us to a fisherman to rent a dive boat. The fisherman told us we must dive 40 to 45 kilometers offshore to avoid strong coastal undertow. I didn't like the idea, but Alfredo and Gilmar decided to go. The fisherman had some great species of shells in his back yard: *Strombus galeatus*, *Strombus peruvianus*, *Pleuroploca princeps* and more.

I went into Esmeraldas to change some money. It is one the ugliest cities I ever saw. Arriving at the main entrance one sees a huge garbage deposit with millions of black scavenger birds wheeling overhead. Most of the city looks like it has been destroyed by a civil war,



Road After El Nino

with no pavement in most of the streets. Incredibly, just a few kilometers south the beaches are quite nice, clean and cared for.

Mid-afternoon, when I picked up Alfredo and Gilmar, I had my first great surprise on the trip. They had found 3 *Colubraria procera*, including a huge 91 mm specimen! I had been trying to find this shell since I had read D. Shasky's article years ago in the *American Conchologist*. They decided to dive again while Marcus and I stayed ashore to contact local fishermen about shells. Guide Miguel, helpful at first, later became annoying; and it was hard to escape his insistence on taking us to different hotel—an ecological one in the middle of nowhere! Waiting for the fishermen early next morning, we looked in the nets at some great shells: *Hexaplex radix*, *Strombus peruvianus* and some small *Columbellidae*. Time to pick up Alfredo and Gilmar... it turned out they had been waiting for more than two hours – the undertow was so strong they had to give up. But they did have time to find the extremely rare *Colubraria jourdani* and *Turbo mazatlanicus*... and one big, beautiful *Cypraea isabellamexicana*.

We decided to visit some other villages to the south. At the end of the road in Musine we bought some large *Anadara*, a favorite Ecuadorian food. They eat it raw with the liquid from inside the shell. This species lives only in mangroves which means the water color is black! With the animal and the dirty water, they put onion, tomato, and garlic, and call it "ceviche de concha." (See my first article about Ecuador, June, 2000)

Miguel finally convinced us to visit the ecological hotel which he said had lots of shells on its beach at low tide. The hotel really was ecological—the room had no walls, only curtains; the sanitary was a big hole in a wood board where we could see your and others' "services"; and the hotel had no electricity or hot water. Wonderful for Tarzan, not for me!

After Esmeraldas we went south to Puerto Lopez and Salango where we surprised our diver friend, Dower. There we planned dives on Isla de la Plata. Next morning the sea was bad and the undertow continued; the hour-and-a-half trip to the island stretched nearly to three. With waves three or four meters high, it was hard to moor the boat. Finally we found anchorage on the opposite side

where, four years before, I had found those *Thais planospira*. The water was cold and the weather bad. I looked for *Thais* in the rocks but found only large *Opeatostoma pseudodon*, *Thais melons*, *Purpura pansa* and *Neorapana muricata*. While Alfredo and Gilmar dived with the compressor, Marcus stayed with me on the rocks. After two hours of this, the sea became too rough so we had to leave. Alfredo and Gilmar collected some nice shells, but nothing special. I was completely disappointed about the *Thais planospira*.

We didn't see even a broken one.



Jouannetia pectinata

Next day Marcus and I stayed ashore to clean shells. Alfredo and Gilmar returned to the island but the sea was worse so they couldn't dive—another very disappointing day. We discussed giving up this area but Alfredo insisted on trying once more. I was worried but he and Gilmar really insisted. You see, I had teased Alfredo for years, telling him the best shells of our 1995 were my finds; he was so intent on besting me that he wouldn't give up! They went off in the rain next morn-

ing, promising to come back if the sea was bad. Marcus and I shelled for land snails. Of course, we just found *Porphyrobaphe iostoma*. That afternoon we arrived early in Salango to meet the boys, who were, of course, late. I was really nervous about the weather situation! Finally Dower's brother saw the boat on the horizon—I don't know how because it was foggy and raining! When they arrived at the beach Alfredo had a funny look on his face—he had found more specimens of *Thais planospira* than I had found in '95!



Mazatlanian fulgurata

The rains were worse so I called Dr. Noboa to see if we could go to his beach house two days early. He agreed and off we went. On this stretch of the road we had to cross 28 broken bridges. The entire pavement disappeared in some areas. It was chaos! Dr. Noboa estimated it would take over a billion dollars to fix the problem but I think he underestimated! He was actually able to do some bridge repairs thanks to an unusual situation—a local businessman had bought some soviet military metal bridges from the former East Germany. He bought cheaply to use the metal but suddenly he had those bridges to rent to the government, saving lots of people from being isolated. With the "El Niño" rains, the normally dry coast was transformed into a green tropical forest!

The Punta Blanca trip was really a big adventure, driving between mud hills on one side and an abyss on the other. Dr. Noboa's housekeeper Carlos was waiting for us that afternoon in Punta Blanca. About Dr. Noboa's house—he had built it in the early 70's when nobody was there. It had no electricity or water at that time, but was wonderfully constructed and won architectural prizes. The house is in the local style on the edge of the hill with beach stairs and a wonderful view. Today beautiful, modern houses abound, but Dr. Noboa's was the pioneer.

Carlos had prepared two bedrooms for us, Marcus with Gilmar, and Alfredo with me. The others won't sleep with me due to my little snoring habit. (According my brother sleeping in a room with me is like sleeping inside a lumber-mill!) What a night that was! Around 2 AM Alfredo waked me with the news that there were shotguns outside the room. I had heard nothing—my internal sound was worse than any external shotgun sounds! Marcus and Gilmar rushed in with the same news. Then I heard shotguns and my imagination started. I didn't know if the housekeeper had locked all the doors. I got really scared: "A fanatical murderer has killed the housekeeper and is planning the same for us!" Or "How can I survive if the killer steals my shells?" We all went into Marcus' room and guarded the door. I woke up early in a really bad mood. I could hear Carlos—thank God! He had survived! I went to ask what happened. He said he couldn't sleep the entire night because a stupid dog kept barking at the moon, so he decided to shoot

at it with shotguns to stop the barking! I wanted to kill that man!

It was impossible to snorkel on the reefs in front in the really bad seas. I decided to visit the village of San Pablo to look for fishermen and shells. Maybe I could get some nice *Phyllonotus brassica* and other species. I also went to a now improved La Libertad to shop for food and other stuff. I bought some bivalves and great shrimp in the fish market. Ecuador is one the worlds largest shrimp exporters. You must see the shrimp sizes, and the prices! I wanted to take home kilos of them!

Dr. Noboa and his wife Maria Isabel arrived on Saturday with some security people and naval personnel. They stayed around the house. So I prepared a special lunch—pasta with shrimp sauce and my special lemon mousse as dessert—a big hit! That night Dr. Noboa showed me an unusual form of *Porphyrobaphe iostoma* that Carlos had collected in the mountains nearby, so I asked if Carlos would help me search for more. Well, we set off, and I had problems even before we arrived at Punta Blanca. This part of the road was pure mud, hard to drive in, even using a 4x4. When I reached the worst stretch of road I lost control of the car, doing about 30 km/h! I slammed the car into a mud bank to avoid the abyss on the other side. Carlos was white and I could barely use my legs! Next we came to a very small, narrow, seemingly unused road. Some parts were pure mud. But I drove carefully and we arrived at the village. I found very few specimens but the local people wanted to help me so I asked them to take the shells to Dr. Noboa's house. The following day I had over 100 shells! It was a local sub-species called *Porphyrobaphe iostoma phasianella*.

Dr. Noboa left for Guayaquil to have a Sunday lunch with his family and we started to prepare the shells for the trip back home. Monday morning the sea was better and Alfredo and Gilmar went to the reefs to collect *Conus princeps lineolatus*.

We left Punta Blanca for Guayaquil, and then Riobamba in the middle of the Andes. In Guayaquil I avoided downtown, crossing instead an area that I could have sworn was in Miami! Beautiful houses and shopping centers. Nothing like the old Guayaquil! Dozens of kilometers later we passed by a flat area completely covered by banana trees. Ecuador is one of the largest producers in the world. You've probably eaten Ecuadorian bananas!

The road into the mountains was really bad, with large holes, bad pavement, and no signs, necessitating frequent stops to confirm our direction. The view was quite nice even though it was cloudy; these

mountains were grand! By the altitude indicator on Marcus' watch we learned we were driving at over 4,000 meters high in places! The Indians typically wore extremely colorful clothes. At one turn of the road we saw a very beautiful group of these Inca descendants in their rainbow-hued clothes, a sharp contrast with the green countryside. Marcus and Alfredo wanted take a picture of them and I needed a pit stop... just when I had started to do what I needed to do, I heard Marcus shouting to us to run! I ran to the car and turned to see Marcus and Alfredo being followed by 50 or 60 Indians, all of them screaming: "Dollar for the photo!" They almost got us! Later Dr. Noboa told us we did the right thing because some of these groups kidnap tourists, asking the government for ransoms to free them! I drove as fast as I could and after a while we were laughing about the situation.



The Indians before they saw Marcus

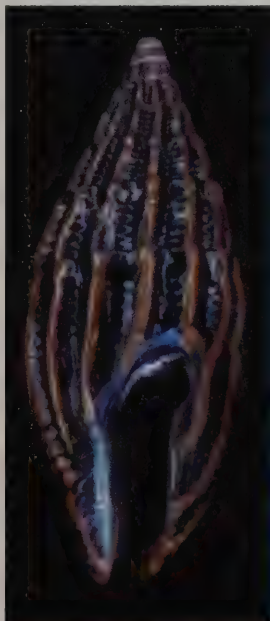
Back in Quito at last! I decided to treat myself; sleepless nights, cold showers, thousands of mosquitoes, terrible roads, rough seas, and crazy Indians had taken their toll; I wanted to stay in a brand new Marriott Hotel. Marcus, usually very frugal on shelling trips, agreed. We put the luggage in the room—the smelly cases in my bedroom! This brand new hotel was really fresh and clean. Of course my room didn't stay this way with over 200 kilos of shells!

Then off we went to visit Dr. Noboa at his office. After he finished his duties he showed us his *Conus* collection which was in Quito so he'd feel closer to the sea! After a pleasant afternoon, we invited him to dine with us at the hotel. I'd never been in an official car with a security car in the front, police cars in the back and motorcycles in both sides! Very interesting. When we arrived in the hotel the security was there and the entire Marriott staff was waiting at the door. We had a wonderful dinner and pleasant night.

In our last day we went to the Presidential Palace to say good-bye and take a look at Quito's old churches and buildings—a UNESCO monument. Then on to the airport where security asked me to open my smelly luggage. One of the guards, unpacking our carry-on, unwrapped the big *Strombus galleatus*. Hundreds of tiny ants poured out of the shell! It was lucky the guard had a good sense of humor! We arrived home in São Paulo on time—no problem going through customs, except for Gilmar's explanation to the Brazilian agent that the shells "spoke in horrible Spanish." We didn't understand either, so he explained that he was so confused by languages that he didn't notice what he said. The agent, equally confused, let him go through.

Again, Ecuador left good memories, even with the funny mix-ups!

* Editor's note: While José Coltro is the writer in the family, it is Marcus Coltro who is the photographer. All the fine pictures which have illustrated this series on Ecuador are the work of Marcus and his camera!



Anachis pardalis



Cymia tecta

CONCHATENATIONS

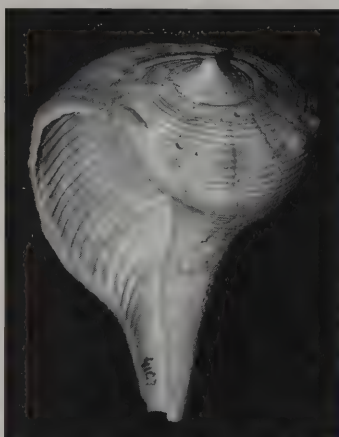
by Gary Rosenberg

New Western Atlantic Gastropods, 1997-1999

More than 80 species of marine gastropods were named from Western Atlantic waters between 1997 and 1999. The benthic shelled species are summarized here. I have given less detail than in previous Western Atlantic round-ups (*American Conchologist* June 1995 and December 1997) in order to list more species.

- Lepetidae:** *Propilidium curumim* Leal & Simone, 1998, Brazil (*Bulletin of Marine Science* 63: 158-164).
- Cocculinidae:** *Macleaniella moskalevi* Leal & Harasewych, 1999, Puerto Rico Trench, 8595 m (*Invertebrate Biology* 118:123-127).
- Pseudococculinidae:** *Amphiplica plutonica* Leal & Harasewych, 1999, Cayman Trench, 7247-7225 m (*Invertebrate Biology* 118:131-133).
- Haliotidae:** *Haliotis aurantium* Simone, 1998, Brazil (*Malacologia* 39:59-75).
- Scissurellidae:** *Anatoma americana* Bandel, 1998, Florida (Mitteilungen aus dem geologisch-palaeontologischen Institut der Universität Hamburg 81:28).
- Schismope colombiana* Bandel, 1998, Colombia (Mitteilungen aus dem geologisch-palaeontologischen Institut der Universität Hamburg 81:60).
- Turbinidae:** *Bothropoma rubrostriatum* Rolán, Rubio & Fernandez, 1997, Cuba (*Argonauta* 11:19-24).
- Siliquariidae:** *Hummelinkiella borinquensis* Faber & Moolenbeek, 1999, Puerto Rico (*Bulletin Zoologisch Museum Universiteit van Amsterdam* 17(5):42).
- Barleeidae:** *Barleeia mexicana* Rolán & Cruz-Abrego, 1998, Quintana Roo, Mexico (*Bollettino Malacologico* 33:3-5).
- Caecidae:** *Caecum eliezeri* Absalão, 1997, Brazil (*Veliger* 40:271-273).
- Rissoidae:** *Zebina unamae* Rolán, 1998, Quintana Roo, Mexico (*Apex* 13:177-179).
- Vitrinellidae:** *Anticlimax decorata* Rolán, Fernández-Garcés & Rubio, 1997, Cuba (*Iberus* 15:32-34).
- Vanikoridae:** *Macromphalina apexplanum* Rolán & Rubio, 1998, Antigua (*Iberus* 16:56-57).
- Macromphalina canarreos* Rolán & Rubio, 1998, Cuba (*Iberus* 16:50-52).
- Macromphalina diazmerlanoi* Rolán & Rubio, 1998, Colombia (*Iberus* 16:56-59).
- Macromphalina garcesi* Rolán & Rubio, 1998, Cuba (*Iberus* 16:42-44, figs. 50-53).
- Macromphalina harryleei* Rolán & Rubio, 1998, Tobago (*Iberus* 16:58-61).
- Macromphalina jibacoa* Rolán & Rubio, 1998, Cuba (*Iberus* 16:54-58).
- Macromphalina paradoxa* Rolán & Rubio, 1998, Cuba (*Iberus* 16:46-48).
- Macromphalina redferni* Rolán & Rubio, 1998, Bahamas (*Iberus* 16:52-54).
- Macromphalina robertsoni* Rolán & Rubio, 1998, Cuba (*Iberus* 16:44-46).
- Macromphalina susoi* Rolán & Rubio, 1998, Florida (*Iberus* 16:61-62).
- Macromphalina thompsoni* Rolán & Rubio, 1998, Panama (*Iberus* 16:62-64).
- Macromphalina worsfoldi* Rolán & Rubio, 1998, Bahamas (*Iberus* 16:48-50).
- Megalomphalus margaritae* Rolán & Rubio, 1998, Florida (*Iberus* 16:36-38).
- Ovulidae:** *Pseudocyphoma christahemmenae* Fehse, 1997, Brazil (*Schriften zur Malakozoologie* 1035-37).
- Ficidae:** *Ficus villai* Petuch, 1998, Nicaragua (*Nautilus* 111:33-35).
- Triphoridae:** *Cheirodonta miskitorum* Rolán & Luque, 1999, Nicaragua (*Iberus* 17:109-112).
- Marshallora nicaraguensis* Rolán & Luque, 1999, Nicaragua (*Iberus* 17:108-109).
- Epitonidae:** *Epitonium fabrizioi* Pastorini & Penchaszadeh, 1998, Argentina (*Nautilus* 112:64-67).
- Iphitus robertsi* Sabelli & Taviani, 1997, off Louisiana (*Nautilus* 110:94-96).
- Muricidae:** *Atiliosa bessei* E. H. Vokes, 1999, Honduras (*Veliger* 42:299-300).
- Atiliosa kevani* E. H. Vokes, 1999, Jamaica (*Veliger* 42:300).
- Atiliosa perplexa* E. H. Vokes, 1999, Brazil (*Veliger* 42:300-302).
- Chicoreus (Siratus) caudacurta* Houart, 1999, off Veracruz, Mexico (*Nautilus* 113:125).
- Chicoreus (Siratus) collellai* Houart, 1999, off Puerto Rico (*Nautilus* 113:121-125).
- Chicoreus (Siratus) vokesorum* Garcia, 1999, Bahamas (*Apex* 14:60).
- Trophon iarae* Houart, 1998, Brazil (*Apex* 13:127-130).
- Columbellidae:** *Nassarina thetys* Costa & Absalão, 1998, Brazil (*Basteria* 62:279-283).
- Buccinidae:** *Pisania bernardoi* Costa & Gomes, 1998, Brazil (*Siratus* 14:15-17).
- Fasciolaridae:** *Fusinus benjamini* Hadorn, 1997, Barbados (*La Conchiglia* 29(282):10-15).
- Fusinus colombiensis* Snyder & Snyder, 1999, Colombia (*La Conchiglia* 31(291):21-22).
- Leucozonia ponderosa* Vermeij & Snyder, 1998, Brazil (*Nautilus* 112:117-119).
- Volutidae:** *Odontocymbiola macaensis* Calvo & Coltro, 1997, Brazil (*Vita Marina* 44(3-4):34).
- Odontocymbiola saotomensis* Calvo & Coltro, 1997, Brazil (*Vita Marina* 44(3-4):34-35).
- Scaphella luizcouthi* Coltro, 1998, Mouchoir Bank, SE of Turks and Caicos Islands (*Siratus* 14:3-5).
- Scaphella worki* Coltro, 1998, Gulf of Mexico (*Siratus* 14:6-8).
- Cystiscidae:** *Persicula hennequini* Boyer, Neefs & Wakefield, 1998, Venezuela (*Journal of Conchology* 36(4):17-18).
- Marginellidae:** *Hyalina chicoi* Espinosa & Ortea, 1999, Costa Rica (*Avicennia* 10/11:179).
- Hyalina cubensis* Espinosa & Ortea, 1999, Cuba (*Avicennia* 10/11:180).
- Osvaldoginella gomezi* Espinosa & Ortea, 1997, Cuba (*Avicennia* 6/7:143-145).
- Prunum holandae* Espinosa & Ortea, 1999, Panama (*Avicennia* 10/11:175).
- Prunum pulidoi* Espinosa & Ortea, 1999, Cuba (*Avicennia* 10/11:174).
- Prunum quinteroii* Espinosa & Ortea, 1999, Cuba (*Avicennia* 10/11:172).
- Volvarina banesensis* Espinosa & Ortea, 1999, Cuba (*Avicennia* 10/11:169).
- Volvarina cachoi* Espinosa & Ortea, 1997, Cuba (*Avicennia* 6/7:114-115).
- Volvarina ceciliae* Espinosa & Ortea, 1999, Cuba (*Avicennia* 10/11:167).
- Volvarina floresensis* Espinosa & Ortea, 1999, Cuba (*Avicennia* 10/11:170).
- Volvarina habanera* Espinosa & Ortea, 1997, Cuba (*Avicennia* 6/7:112-114).
- Volvarina lineae* Espinosa & Ortea, 1999, Cuba (*Avicennia* 10/11:168).
- Volvarina pepefragai* Espinosa & Ortea, 1997, Cuba (*Avicennia* 6/7:115-116).
- Volvarina socoae* Espinosa & Ortea, 1999, Costa Rica (*Avicennia* 10/11:171).
- Cancellariidae:** *Cancellaria mediamericana* Petuch, 1998, Nicaragua (*Nautilus* 111:35-36).
- Conidae:** *Conus bertarollae* Costa & Simone, 1997, Brazil (*Siratus* 13:3-8).
- Conus cerutti* Cargile, 1997, Nicaragua (*La Conchiglia* 29(282):48-54).
- Conus cuna* Petuch, 1998, Panama (*La Conchiglia* 30(287):30).
- Conus donnae* Petuch, 1998, Bahamas (*La Conchiglia* 30(287):31).
- Conus edwardpauli* Petuch, 1998, Panama (*La Conchiglia* 30(287):32).
- Conus ignotus* Cargile, 1998, Quita Sueno bank, off Nicaragua (*Siratus* 14:9-14).
- Conus jacarusoii* Petuch, 1998, Bahamas (*La Conchiglia* 30(287):27).
- Conus lenhilli* Cargile, 1998, Mouchoir Bank, SE of Turks and Caicos Islands (*Siratus* 14:18-19).
- Conus ortneri* Petuch, 1998, Bahamas (*La Conchiglia* 30(287):33).
- Conus paschallii* Petuch, 1998, Nicaragua (*Nautilus* 111:36-37).
- Conus rosalingensis* Petuch, 1998, Honduras (*La Conchiglia* 30(287):34).
- Conus stanfieldi* Petuch, 1998, Bahamas (*La Conchiglia* 30(287):35).
- Conus worki* Petuch, 1998, Brazil (*La Conchiglia* 30(287):25).
- Conus zylmanae* Petuch, 1998, Bahamas (*La Conchiglia* 30(287):28).
- Terebridae:** *Terebra crassireticula* Simone, 1999, Brazil (*Zoosystema* 21:222-224; replacement name for *Terebra reticulata* Simone & Verissimo, 1995, non J. de C. Sowerby, 1840).
- Terebra leptapsis* Simone, 1999, Brazil (*Zoosystema* 21:229-233).
- Terebra mugridgeae* Garcia, 1999, Mississippi (*Apex* 14:64).
- Terebra spirosulcata* Simone & Costa, 1999, Brazil (*Zoosystema* 21:237-241).
- Terebra sterigma* Simone, 1999, Brazil (*Zoosystema* 21:241).
- Turridae:** *Brachycythara multicinctata* Rolán & Espinosa, 1999, Cuba (*Bollettino Malacologica* 34:47-49).
- Cochlespira elongata* Simone, 1999, Brazil (*Revista Brasileira de Zoologia* 16:105-114).
- Corniostridae:** *Corniostra floridana* Bieler & Mikkelsen, 1998, Florida Keys (*Malacologia* 40:307-313).
- Tomura xenoskeneoides* Rubio & Rolán, 1998, Quintana Roo, Mexico (*Iberus* 16:120-122).
- Omaliogridae:** *Ammonicera plana* Simone, 1997, Brazil (*Journal of Conchology* 36:44-48).
- Pyramidellidae:** *Turbonilla nesiotis* Pimenta & Absalão, 1998, Cuba (*Journal of Conchology* 36:63; replacement name for *Turbonilla abrupta* Clessin, 1900 non Bush, 1899).
- Turbonilla zulmae* Pimenta & Absalão, 1998, Argentina (*Journal of Conchology* 36:63; replacement name for *Turbonilla elongata* Castellanos, 1982, non Pease, 1868).
- Cylindrobullidae:** *Cylindrobulla gigas* Mikkelsen, 1998, Florida Keys (*Zoologica Scripta* 27:56-58).

(Aigen article continued from page 21)



Busycon roseae - immature, 36 mm diameter, moderately coarse sculpture with only a few small spines and a very flattened spire.

the characteristics of the mature shell described above. One specimen (about four whorls, 58-mm diameter) has weaker cording and almost a smooth midbody. It is thin shelled with weak internal lirae, and has 14 weak broad spines. On the face of it, it should not be included with *B. roseae*, but in shape it is nearly identical with a typical shell of the same size from South Bay that has only very insignificant spines. Immature shells are very difficult to characterize, being all variants in a variable population.

Note that the common Early to Late Pliocene *B. contrarium* (Conrad, 1840) has spined submature and adult forms (extremely close in shape to *B. sinistrum*), and a spineless, immature holotype (Petuch, 1994.)

The underlying Plio-Pleistocene Caloosahatchee Formation, has a form (*B. palmbeachensis* Petuch, 1994) which is the probable ancestor of *B. roseae*. Smooth or weakly spined both in immature and adult forms, the relatively uncommon mature form is distinctly large and heavy with a rounded shoulder. The massive body whorl overlaps the preceding shoulder causing a low spire. The immature form is almost identical to immature *B. contrarium*, with moderately high, slightly stepped whorls.

A specimen from the nearby, now-closed Star or Bergeron pit, about 12 miles (20 KM) south of South Bay off State Road 27, appears to be a large, submature *B. roseae* without any spines. It is probably *B. palmbeachensis*. I do not have a good growth series for that species, and it may fit into it! It is about 85 mm in diameter with about 5 whorls, and is shaped very close to the holotype of *B. roseae*. It has coarse cords (although they are nearly obsolete on the midbody), essentially no spines (although knobbier in the first few whorls than the later), and a relatively thin lip without lirae. I do not know the stratigraphic unit it came from. The shells I collected from this pit were apparently from either the Caloosahatchee or the Bermont Faunas. The Holey Land Unit Fauna may not have been present. Anyone with a good collection from this pit, or with a good growth series from a definite Caloosahatchee Fauna may be able to help.

I would also like to know what has been found in the Loxahatchee Fauna, based on specimens with good locality and stratigraphic data. *B. roseae* may intergrade with *B. sinistrum* in the Loxahatchee Fauna, if it occurs there at all. Petuch (1994) restricts *B. sinistrum* to the Fort

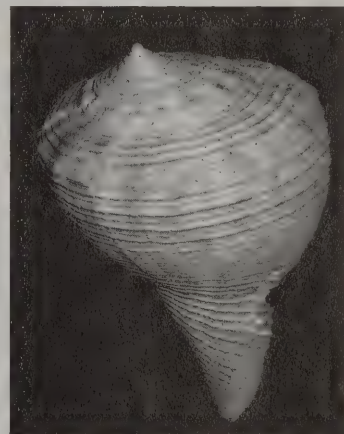
Thompson Fauna and to the Recent. He may have left the Bermont and Loxahatchee Fauna spiny forms unnamed simply because they are not distinct enough to name, but not identical to a named form. It would be worthwhile to document the changes.

Probably the typical thick-shelled, coarse-corded, generally spineless form is characteristic of the Holey Land Fauna and basal Bermont Faunas, and evolved (during the Bermont) into the rounded-spined and sometimes thin shelled and weakly corded forms. They may represent ecophenotypes whose thick shells may have been a response to crab predation on young specimens. I have found no mature specimens from the Holey Land Unit Fauna, but mature forms probably would be weakly spined. Although the total thickness of the Bermont Fauna at South Bay is only about 20-30 feet (6-10M), there are a fair variety of depositional environments represented (mostly shallow water), and the spiny and/or mature shelled forms may be restricted to, or more characteristic of, upper strata.

There are complications to this picture. *B. holeylandicum* Petuch, 1994, was also described from the Holey Land Unit Fauna from the Griffin pit. It is a distinctive form with an angled shoulder, with numerous sharp, small spines. Close to the size of the *B. roseae* holotype, it is probably also immature. I have not found this species; it is probably rare and restricted to the Holey Land Fauna. *B. labelleensis* Petuch, 1994 is another stratigraphically restricted form, but from the Griffin Pit Fauna (a small remnant of the Caloosahatchee Fauna.) It looks like a finely sculpted, immature *B. palmbeachensis* which retains its immature shape into submaturity. Again, restricted, small, stressed faunas can lead to rapid evolution. Apparently both these "form species" also rapidly went extinct.

B. caloosahatcheensis Petuch, 1994, described from the Caloosahatchee Fauna, is another problem. Similar in shape to *B. roseae* (but more finely sculpted), it seems to be a low spired, submature *B. palmbeachensis*. I would like to hear from anyone who collected it.

So, there are apparently two intergrading forms of the Bermont left handed whelk, but probably only one species. Whether Petuch's name will remain as a species name, a subspecies, or as a variety (which may or may not include both forms), will remain for future workers to decide. If you would like to help the process, send me data on what you found, or send it to the editor for publication.



Busycon roseae - immature, 53 mm diameter. Coarse sculpture with a flattened spire showing spines covered by the body whorl.

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
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
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